A

Most pleasant Prospect.

INTO THE GARDEN of Naturall Contemplation,

to behold the naturall causes of all kinde of Meteors.

As well fiery and airie, as watrie and earthly: of which sort the blazing Starres, shooting Starres, Flames in the Aire, &c. Thunder, Lightning, Earthquakes, &c. Raine, Dew, Snow, Clouds, Springs, &c. Stones, Metals, and Earths: To the glory of God, and the profit of his Creatures.

By *W. Falke* Doctor of Divinity.

Praise the Lord upon earth, Dragons, and all Deepes; Fire, Haile, Snow, Ice, Winde and Storms that doe his will. Psal. 148.

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FINIS.

THE FIRST BOOKE

FOr as much as we entend in this Treatise, to declare the causes of all those bodies, that are generated in the earth called Fossilia, as well as those other Impressions, named of their height Meteors (which no writer hitherto hath done, that we have seen) the common definition given by the most Writers, in no wise will serve us, and whether we may borrow the name of Metcoron, to comprehend the whole subiect of our worke, we are not altogether out of doubt, although the Philosopher deriving it from doubtfulnes, giveth us some colourse to take it, and peradventure we might be as well excused to apply it to Minerals, as other authors are to use it for earthquaks: yet to avoid all occasions of cavilling at words, we shall both define and also describe the subiect of our matter on this maner: it is a body compound without life naturall: & yet to stop one hole, because here wanteth the name of the thing to be

 defined,

Hote baths. ibid
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defined, it is no new thing to them that haue
Aristotles. read Aristotles workes, to find a definition
of that whereof there is no name. But
what need you be so precise (will some man
saye) mean you so to proceed in all your dis-
course: no verily, but because many of quick
iudgement, not considering the stile to bee
attempered to the capacitie of the readers,
will impute the plainenesse to the igno-
rance of the Authors, wee thought good in
the beginning to pluck the opinion out of
their minds (that as the common saying is)
they may know, wee haue skill of good man-
ners, though welittle vse them.

The Meteors are deuided after three
maner of wayes: first, into bodies perfectly
and imperfectly mixed: Secondly, into
moist impressions and drie: Thirdly, into fi-
ery, ayry, watry, and earthly. According to
this last diuision, we shall speak of them in
foure bookes following: but first wee must
be occupied alittle in the generall descrip-
tion of the same, that afterward shall be
particularly intreated of.

Why they be called vnperfectly mixed.

They are called vnperfectly mixed, be-
cause they are very soone changed into
another thing, and resolued into their pro-
per

per elements of which they doe most consist, as doe all impressions, fyrie, ayrie, watrie: as snow into water, cloudes into waters &c.

Why they be called perfectly mixed.

The last sort, namely earthlie Meteors, are called perfectly mixed, because they will not easily be changed and resolued from that form which they are in, as bones, metalls and other mineralls.

According to the qualitie of the matter, they are divided into moist & drie impressions, consisting either of Vapors, or exhalations. Vapors are called moist, and exhalations drie, which termes must be well noted, because they must be much used.

Of the generall cause of all Meteors, and first of the materiall cause.

The matter wherof ỳ most part of Meteors doth consist, is either water or earth: for out of the water, proceed vapors, and out of the earth come exhalations. The materiall cause.

Vapor, as ỳ philosopher saith, is a certaine watrie thing, and yet is not water: so exhalation hath a certaine earthly nature in it, but yet it is not earth. What be vapors and what exhalations.

For the better understanding of Vapors understand that they be, as it were

fumes or smokes, warme and moist, which will easily bee resolved into water, much like to the breath that proceedeth out of a mans mouth, or out of a pot of water standing on the fire. These vapours are drawn up from the waters and watery places by the heat of the Sun, even unto the middle region of the ayre, and there after divers manner of meeting with coldnesse, many kind of moist Meteors are generated, as sometimes clouds and raine, sometime snow and haile; and that such Vapours are so drawn up by the Sunne, it is plaine by experience: for if there be a plash of water on a smooth and hard stone, standing in the heat of the Sunne, it will soone be drie, which is none otherwise, but that the Sunne draweth up the water in thinne Vapors: for no man is so fond to say, that it can sinke into stone or mettall, and it is as great folly to thinke, it is consumed to nothing: for it is a generall rule, that that which is once a thing, cannot by changing become nothing: wherefore it followeth, that the water on the stone, as also on the earth, is for the most part drawn up, when the stone or earth is dried.

What the middle region is shall bee told afterward.

A generall rule.

What Exhalations be.

Exhalations are as smokes that be hoat

and

and dry, which because they be thinne, and lighter than Vapours, passe the lowest and middle region of the ayre, and are carried up even to the highest region, where for the excessive heat, by neerenesse of the fire, they are kindled, & cause many kind of impressions. They are also sometimes viscose, that is to say, clammy, by reason whereof, they cleaving together and not being dispersed, are after divers sorts set on fire, and appeare sometimes like Dragons, sometime like Goates, sometimes like candles, sometime like speares.

By that which is spoken of Vapours and Exhalations, it is evident, that out of the fire and ayre, no matter whereof Meteors should consist, can be drawn, because of their subtilty and thinnesse. For all Exhalations is, by making a grosser body more thinne: but the fire (we meane the elementall fire, and not the fire of the kitchen chimney) is so subtill and thinne, that it cannot bee made thinner: likewise the ayre is so thinne, that if it be made thinner, it is changed into fire: and as the fire, if it were made thicker, would become ayre, so the ayre being made grosser, would be turned into water. Wherefore to conclude

this part, the great quantitie of matter, that causeth these Meteors, is taken out of the earth and the water. As for the aire and the fire, they are mixed with this matter as with all other things, but not so abundantly, that they may bee said the materiall cause of any Meteor, though without them none can be generated. The efficient cause of all Meteors is that cause which maketh them, euen as the Carpenter is the efficient cause of an house. This cause is either first or second.

The efficient cause.

The first and efficient cause is God the worker of all wonders, according to that testimonie of the Psalmist, which saith, Fire, haile, snow, ice, wind and stormie, doe his will and commandement, he sendeth snow like wooll, &c. Almightie God therefore being the first, principall and vniuersall cause efficient of all naturall works and effects, is also the first cause of these effects, whose profit is great, and operation marueylous.

The second cause efficient, is double, either remote, that is to say, farre off or next of all. The farther cause of them, as of all other naturall effects, are the same, the Sun with the other Planets and Stars, and the vertie heauen it selfe in which they are mo-

ued

ned. But chiefly the Sunne, by whose heat all or at least wise, the most part of the vapors and exhalations are drawne up.

The next causes efficient as the first qualities, are heat and cold, which cause diuers effects in vapors and exhalations.

But to returne to the heat of the Sunne, which is a very neere cause, it is for this purpose two wales considered.

One way, as it is meane and temperate.

Otherwise, as it is vehement & burning. The meane, is by which hee draweth vapors out of the water, and exhalations out of the earth, and not onely draweth them out, but also lifteth them vp very high from the earth into the aire, where they are turned into diuers kinds of Meteors.

The burning heat of the Sunne is, by which hee burneth, dissipateth and consumeth the vapors and exhalations before he draweth them up, so that of them no Meteors can be generated.

These two heats proceed from the Sun, either in respect of the place, or the time, but most properly according to the casting of his beames either directlie or vndirectlie.

In place where the Sunnes beames

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In place where the Sunnes beames

ſtrike directly againſt the earth and the water, the heate is ſo great, that it burneth up the Exhalations and Vapours, ſo that there are no fiery Meteors, much leſſe watery, as it is in the South parts of the world, under and neere to the Equinoctiall line.

But in places where the beames are caſt indirectly & obliquely, and that where they are not too nigh to the direct beames, nor too farre off from them, there is a moderate heate, drawing out great abundence of matter, ſo that in thoſe Countries, many Meteors of many ſortes are generated, as in the far North parts are few but watery impreſſions. Alſo in Autumne and Spring, are oftener Meteors ſeene, than in Summer and winter, except it be in ſuch places where the Summer and Winter are of the temper of Spring and Autumne. Let this be ſufficient for the efficient cauſes of impreſſions, as well firſt and principall, as ſecond and particular. Concerning the formall and finall cauſe, we have little to ſay, becauſe the one is ſo ſecret, that it is known of no man: the other ſo evident, that it is plaine, to all men. The eſſentiall forme of all ſubſtances, Gods wiſedome

compre-

comprehendeth, the universall chiefe and last end of all things, is the glory of God. Middle ends (if they may be so called) of these impressions, are manifold profits to Gods creatures, to make the earth fruitful, to purge the aire, to set forth his power, to threaten his vengeance, to punish the world, to move to repentence, all the which are referd to one end of Gods eternall glory, ever to be praysed, Amen.

Of the places, in which they are generated.

The places in which Meteors are caused, be either the ayre or the earth: in the ayre be generated raine, hayle, snow, dew, blazing starrs, thunder, lightning, &c. In the earth be welles, springs, earthquakes, metals, minerals, &c. made, and as it were, in their mothers belly begotten and fashioned. But for the better understanding hereof, such as have not tasted the principles of Philosophy, must consider that there be foure elements, Earth, Water, Ayre, and Fire, one compassing another round about, saving that the waters by Gods commandement are gathered into one place, that the land might appeare. The highest is the speare of the Fire, which

toucheth

toucheth the hollownesse of the moones heauen: the next is the aire, which is in the hollownesse of the fire: the aire within his hollownesse, comprehendeth the water and the earth, which both make but one sphere or Globe, or as the common sort may vnderstand it, one ball. So each element is within another, as the scales of a perte are one aboue another: or (to vse a grosse similitude) as the yxles of an Onion are one within another: after the same sort from the highest heauen to the earth, that is lowest, one part that is greater compasseth round about another that is lesser. But for this present purpose it is to be knowne, that ỹ aire is deuided into three regions, ỹ highest, the midle and the lowest. The highest because it is next to the region of the fire is exceeding hot: the lowest being next the earth & waters, is temperate & by repercussion or striking backe of the sun beams waxeth hot, and by absence of them is made cold being subiect to winter and summer. The middle region of the aire, is alwaies exceeding cold, partly because the sun beams cannot be cast back so high, and partly because the cold that is there, betweene the heate aboue, and the heat beneath it, is so

What the regions of the aire be.

kept

kept in, that it cannot get out, so that it must nœds bee excessiuely cold: for the water and the earth being both cold Elements after the sun setting in the night season, doe cole the aire, euen to the middle region. But in the morning the sunne rising warmeth the aire, so farre as his beames which are beaten backe from the earth and the water, can extend and reach, which is not so high as the middle region, and by beat on both sides is inclosed and kept, sauing that a little thereof falleth downe in the night, which the next day with much more is driuen backe againe. Wherefore this region being so cold, is dark and cloudy, in so much that some doting Diuines haue imagined purgatory to be there in the middle region of the aire. In the highest region be generated Comets or blazing starres and such like of diuers sorts. In the middle region clouds raine, stormes, windes &c. In the lowest region, dew, frost, hore-frost, mists, bright rods, candles burning about graues, and gallowses, where there is store of clamp, fattie or oily substance, also lights and flaming fiers, seene in fields, &c,

¶ And thus much for the generall causes of all Meteors.

THE

THE SECOND BOOKE
of fiery Meteors.

A Fiery impression, is an Exalation set on fire, in the highest or lowest region of the ayre, or else appearing as though it were set on fire and burning.

They are therefore divided into flames and apparitions. Flames are they, which burne indeede, and are kindled with fire. These are discerned by foure waps: by the fashion of them, by their place, by the abundance of their matter, and by the want of their matter. Their placing is after the abundance and scarcity of the matter whereof they consist: for if it be great, heavy and grosse, it cannot be carried so farre as the middle region of the ayre, and therefore is set on fire in the lowest region: if it be not so great, light, and full of heat, it passeth the middle region, and ascendeth to the highest, where it is easily kindled and set on fire.

According to their divers fashions, they have divers names: for they are called burning stubble, torches dancing or leaping Goates

Goates, ſhoting or falling ſtarres, or candles burning beams, round pillers, ſpears, ſhields, Globes or bowles, firebrands, lampes, fiying Dragons or fire drakes, painted pillers or broched ſteeples, or blazing ſtarres, called Comets. The time when theſe impreſſions doe moſt appeare, is the night ſeaſon: for if they were cauſed in the day time, they could not be ſeene, no more than the ſtarres be ſeen, becauſe the light of the Sunne which is much greater, dimmeth the brightnes of them being leſſer.

Of the generation of the impreſſion, called burned ſtubble or ſparckles of fire.

Sparks of fire.

THe generation of this Meteor is this: when the matter of the Exhalation is in all parts alike thin, but not compacted or knit together, then ſome part of it being carryed up into the higheſt Region, by the fiery heat is ſet on fire before another part, that commeth up after it, ſo being kindled by little & little, flieth abroad like ſparkles out of a chimney, inſomuch that the common people ſuppoſe, that an infinite number of ſtars fall down, whereas it is nothing elſe, but the Exhalation that is thin, kindled in many parts, ſparkling, as when ſawduſt or cole-duſt is caſt into the fire.

Of

Of Torches.

Torches. TOrches or firebrands are thus generated: when the matter of the exhalation is long and not broad, being kindled at one end thereof in the highest region of the aire it burneth like a torch or firebrand, and so continueth till all the matter be burned up, and then goeth out, none otherwise than a Torch, when all the stuffe is spent, must nedes burne no longer.

Of dancing or leaping Goates.

Daunting Goats. DAunting Goats are caused when the exhalation is divided into two parts, as when two torches be seene together, and the flame appeareth to leape or daunce from one part to the other, much like as bals of wild fire daunce up and downe in the water.

Of shooting and falling stars.

Shooting Stars. A Flying, shuting, or falling star, is when the exhalation being gathered as it were on a round heape, and yet not throughly compacted in the highest part of the lowest region of the ayre, being kindled by the sodaine cold of the middle region, is beaten backe, and so appeareth as though a starre should fal, or slide from place to place. Sometime it is generated after another sort, for there

for there is an exhalation long and narrow which being kindled at one end, burneth swiftly, the fire running from end to end, as when a silke thread is set on fire at the one end. Some say it is not so much set on fire, as that it is direct under some Starre in the firmament, and so receiving light of that starre, seemeth to our eies to bee a Starre. Indeed sometimes it may be so, but that it is not so allwayes, nor yet most commonly, as it may be easily demonstrated. The Epicurians, as they are very grosse in determining the chiefe goodnesse: so they are verie fond in assigning the cause of this Meteor. For they say, that the starres fall out of the firmament, and that by the fall of them, both thunder and lightning are caused: for the lightning (say they) is nothing else but the shining of that Starre that falleth, which falling into a watrie cloude, and being quenched in it, causeth that greate thunder, euen as hot yron maketh a noise if it bee cast into cold water. But it is evident, that the starres of the firmament cannot fall, for GOD hath set them fast for euer, he hath giuen them a Commandement which they shall not passe. And though they should

The Epicurians Opinion.

Ps. 148.

fall

fall into the cloud, yet could they not rest there, but with their weight being driuen downe, would cover the whole earth.

The greatnes of Starres.

For the least starre that is seen in the firmament, is greater than all the earth. Here will step forth some merry fellow, which of his conscience thinketh them not to be above three yards about, and say it is a loud lie, for he can see within the compasse of a bushell, more than 11. starrs. But if his bushell were on fire 11. mple of, I demand how bigge it would seeme unto him: he that hath any wit, will easily perceive, that starres being by all mens confession, so many thousand miles distant from the earth, must needs be very great, that so far off should be seen in any quantity. Thus much for the shooting or falling starres.

A proofe of the Starres greatnes.

Of burning Candles.

Burning candles.

When the Exhalation carried up into the highest part of the ayre, is in all parts thereof of equall and like thinnes, & also long, but not broad, it is set on fire and blazeth like a candle, untill the Exhalation be quite consumed.

Burning Beames and round pillers.

Of burning Beames and round pillers.

These are caused, when the Exhalation being

being long and not very broad, is set on fire all at once, and so burneth like a great beame or logge. The difference of beames and pillers is this: for beams are when they seeme to lie in length in the ayre, but they are called pillers, when they stand right up, the one end neerer to the earth, than the other.

Of burning speares.

BUrning speares are generated, when a great quantity of erhalations, which may be called a dry cloud, is set on fire in the middest, and because the cloud is not so compact, that it should suddenly rend, as when thunder is caused, the fire breaketh out at the edges of the cloud, kindling the thinne Exhalations, which shot out in great number like fiery speares, or darts, long & very small, wherefore they continue not long: but when they fayle, within a short while after, more fire breaking out, they shot as many more in their place: and likewise, when they are gone, other succeed, if the quantity of the matter will suffice, more than a douzen courses. This impression was seene in London, Anno Dom. 1560. the thirty day of

Burning Speares.

January, at eight of the clock at night, the ayre in all other places being very darke, but in the North east where this cloud burned, it was as light as when the day breaketh toward the Sunne rising, in so much, that plaine shaddow of things oppoſite was ſeene. The edge of this cloud was in fashion like the Raynebow, but in colour very bright, and oftentimes casting forth almoſt innumerable dartes, of wonderfull lenght, like ſquibs that are caſt up into the ayre, ſaving that they moved more ſwiftly then any ſquibs.

Of Shields, Globes or bowles.

Shields Globes or Bowles.

These Meteors also have their name of their fashion, because they are broad, and appeare to be round, otherwiſe their generation differeth not from the cauſe of the like impreſſions before mentioned.

Of Lampes.

The Lampe conſiſteth of an Exhalation [illegible] broad & thick, but not equally [illegible] namely, ſmaller at one end than [illegible] other, being kindled about the [illegible], burneth like a lamp. The [illegible] well this impreſſion, as ma- appeareth round, is not for that [illegible] they are round indeed, but becauſe the

the great distance causeth them to seem so. For even square formes far off seeme to be round. It is written, that a lamp fell down at Rome, when Germanicus Cæsar set forth the fight of sword players.

Of flying Dragons or fire Drakes.

Flying Dragons or fire Drakes.

FLying Dragons, or as Englishmen call them, fire Drakes, be caused on this maner. When a certaine quantity of vapors are gathered together on a heap, being very neere compact, & as it were hard tempered together, this lump of vapors ascending to ỳ region of cold, is forcibly beaten back, which violence of moving, is sufficient to kindle it, (although some men will have it to be caused between 2. clouds, a hote and a cold, then the highest part, which was climing upward, being by reason more subtill & thin, appeareth as the Dragons neck, smoking, for that it was lately in the repulse bowed or made crooked, to represent the Dragons belly. The last part by ỳ same repulse turned upward, maketh the taple, both appearing smaller, for that it is further off, & also, for that the cold bindeth it. This dragon thus being caused, flieth along in the ayre, & sometime turneth to & fro, if it meet with a cold cloud to beat it back, to ỳ great

terrour of them that behold it: of whom some call it a fire Drake: some say it is the Devill himselfe, and so make report to other. More than 47. yéres agoe, on May day, when many young folke went abroad early in the morning, I remember by fire of the clocke in the forenoone, there was newes come to London, that the Devill, the same morning, was seene flying over the Thames: afterward came word, that he lighted at Stratford, and there was taken and set in the Stockes, and that though he would faine have dissembled the matter, by turning himselfe into the likenesse of a man, yet was he knowne well enough by his cloven foote. I knew some then living, that went to sée him, and returning, affirmed, that hee was indeede seene flying in the ayre, but was not taken prisoner. I remember also, that some wished hee had been shot at with Gunns or shafts, as he flew over the Thames. Thus doe ignorant men judge of these things that they know not. As for this Devill, I suppose, it was a flying Dragon, whereof wee speake, very fearefull to looke upon, as though hee had life, because he moveth,

beth whereas he is nothing else but clowds and smoake: so mighty is God, that he can feare his enemies with these and such like operations, whereof some examples may be found in holy Scripture.

Of the Pyramidall pillar like a spire or broched Steeple.

Of Spires.

This sharp poynted piller, is generated in the highest region of the ayre, and after this sort: When the Exhalation hath much earthly matter in it, the lighter parts and thinner (as their nature is) ascending upward, the grosser, heavier, and thicker, abide together in the bottome, and so is it of fashion great beneath, and small poynted above, and beeing set on fire, it is so seene, and thereof hath his name.

Of fire scattered in the ayre.

Fire scattered.

Fyre scattered in the ayre, or illuminations, are generated in the lowest region of the ayre, when very drie and hote Exhalations are drawne up, and meeting with cold Clowdes, are sent back againe, which motions doe set them a fire; whose parts being not equally thick or joyned together, seeme as

though fire were scattered in the ayre: yea sometimes, the whole ayre seemeth to burne, as though it would rayne fire from Heaven, & so it hath come to passe, burning both Cities and Townes. Then iudge how easy it was for God to raine fire upon Sodom & Gomorra, for their sins & wickednes.

Of lights that goe before men, and follow them abroad in the fields, by the night season.

Light that goeth before men & followeth them in the night.

THere is also a kinde of light that is seene in the night season, and seemeth to goe before men, or to follow them, leading them out of their way unto waters, & other dangerous places. It is also very often seene in the night, of them that saile in the Sea, and sometime it will cleabe to the mast of the Shippe, or other high parts, sometime slide round about the Shippe, and either rest in one part till it goe out, or else be quenched in the water. This impression seene on the land, is called in Latine, Ignis fatuus, foolish fire, that hurteth not, but only feareth fooles. That which is seene on the Sea, if it be but one, is named Helena, if it be two, it is called Castor and Pollux.

The foolish fire, is an Exhalation kindled

kindled by meanes of violent moving, when by cold of the night, in the lowest region of the ayre, it is beaten downe, and then commonly, if it be light, seeketh to ascend upward, and is sent downe againe; so it danceth up and downe. Else if it move not up and downe, it is a great lumpe of glewish or oyly matter, that by moving of the heat in it selfe, is enflamed of it selfe, as mosse hay will be kindled of it selfe. In hote and fennie Countries, these lightes are often seene, and whereas is abundance of such unctuous and fat matter, as about Church-yards, where through the corruption of the bodies there buried, the earth is full of such substance: wherefore in Church-yards, or places of common buriall, oftentimes are such lights seene, which ignorant and superstitious soules have thought to be soules tormented in the fire of Purgatory. Indeed the devill hath used these lightes (although they be naturally caused) as strong delusions to captive the minds of men, with feare of the Popes Purgatory, whereby he did open injury to the blood of Christ, which only purgeth us from all our sins, and delivereth us from all torments, both

tempozall and eternall, accozding to the saying of the wise-man, The soules of the righteous are in the hands of God, and no tozment toucheth them. But to returne to the lights, in which, there are yet two things to bs considered, First, why they lead men out of their way. And secondly, why they seeme to follow men and goe befoze them. The cause why they lead men out of the way, is, that men, while they take heed to such lights, and are also soze afraid, they forget their way, and then being once but a little out of their way, they wander they wot not whither, to waters, pittes, and other very dangerous places. Which, when at length they hap the way home, will tell a great tale, how they have beene led about by a spirit in the likenesse of Fire. Now the cause why they seeme to goe befoze men, oz to follow them, some men have said to bee the moving of the ayze, by the going of the man, which ayze moved, should dzive them fozward, if they were befoze, and dzaw them after if they were behind. But this is no reason at all, that the Fire, which is oftentimes three oz foure miles distant from the man

that

that walketh, should bee mooued to and fro by that ayre which is moued through his walking, but rather the moving of the ayre and the mans eyes, causeth the fire to seeme as though it moued: as the Moone to children seemeth, if they are before it, to run after them: if shee be before them, to run before them, that they cannot ouertake her, though she seeme to be very neere them. Wherefore these lights rather seeme to moove, than that they be moued indeed.

Of Helena, Castor, and Pollux.

Helena, Castor, Pollux.

WHen the like substance in the lowest region of the ayre, ouer the Sea, by the like occasion is set on fire, if it be one only, it is called Helena, if there be two, they are called Castor and Pollux. These impressions will oftentimes cleave to the mast, and other parts of the Ships, by reason of the clammineſſe and fatneſſe of the matter. Helena was of the Heathen men, taken as a Goddeſſe, the daughter of Jupiter and Leda. Castor and Pollux were her brethren. Helena was the occasion that Troy was destroyed: therefore the Mariners by experience trying, that one

flame

flame of fire appearing alone, signified tempest at hand, supposed the same flame to be the goddesse Helena, of whom they looked for nothing but destruction. But when two lights are seene together, they are a token of faire weather, and good luck: the Mariners therefore beleeved, that they were Castor and Pollux, which sayling to seeke their sister Helena, being caried to Troy by Paris, were neder seene after and thought to be translated into the number of the Gods that give good successe to them that sayle, as we read in the last Chapter of the Acts of the Apostles, that the Shippe wherein S. Paul sayled, had a badge of Castor and Pollux. A naturall cause why they may thus foreshew either tempest or calmnesse, is this. One flame alone may give warning of a tempest, because that as the matter thereof is compact, and not dissolved, so it is like, that the matter of tempest (which never wanteth) as winde and cloudes, is still together, and not dissipated, then is it like not long after to arise. By two flames together may be gathered, that as this Exhalation which is very thick, is divided: so the thick

matter

matter of tempest is dissolved and scattered abroad, by the same cause that this is divided. Therefore not without a reason, the Pariner to his mates may promise a prosperous course.

Of flames that appeare upon the haires of men or beasts.

There is yet another kind of fiery impression, which is flames of fire upon the haires of men & beasts, especially horses. These are sometime clammy Exhalations, scattered abroad in the ayre in small parts, which in the night, by resistance, of the cold, are kindled, cleaving on horses eares, on mens heades and shoulders that ride or walke. In that they cleave upon hayres, it is by the same reason, that the dew will be seene also upon hayres or garments, whose wooll is high, as fryse mantels and such like. Another sort of these flames, are caused, when mens or beasts bodies being chafed, send forth a fat & clammy sweat, which is in like maner kindled as the sparks of fire that are seene when a black horse is currred. Livius reporteth of Servius Tullius, that as he lay asleep, being a child, his hayre seemed to be all on a flame, which for

Flames upon haires of men and beasts.

Livius. Servius Tullius.

for all that, did not burne his haire, or hurt him. The like history he reciteth of one Marius, a Knight of Rome, that as he made an Oration to his Souldiers in Spaine, they saw his head burning on a light fire, and himselfe not ware of it. Thus much concerning these flames.

Marius.

Of Comets or Blazing Starres.

Comets of blazing Starres.

A Comet is an Exhalation, hote and drie, of great quantity, fat & clammie, hard compact like a great lumpe of pitch, which by the heat of the Sunne, is drawne out of the earth, into the highest region of the ayre, and there, by the excessive heat of the place, is set on fire, appearing like a starre with a blazing taple, and sometime is moved after the motion of the ayre, which is circular, but it never goeth downe out of the compasse of sight, though it be not seene in the day time for the brightnesse of the Sunne, but still burneth untill all the matter be consumed. An argument of the greatnesse is this, that there was never any Comet yet perceived, but at the last it endured 7. dayes: but much longer they have been seen, namely, forty dayes long, yea, foure-

foureſcore daies. and ſome, fiue moneths together. Wherefore it muſt needs be a wonderfull deale of matter, that can giue ſo much nouriſhment, for ſo great and ſerbent fire, and for ſo long a time. There are conſidered in a Comet, ſpecially the colour and faſhion, which both ariſe of the diſpoſition of the matter. Their colours be either white, ruddie, or blew. If the matter be thinne, the colour is white. If it bee meanely thick, then is the Comet ruddie, after the colour of our fire: but when the matter is very thick, it is blew, like the burning of Brimſtone. And as the matter is more and leſſe, after this diſpoſition: ſo is the Comet of colour, more or leſſe, like to theſe three principall colours. ſome yellowiſh, ſome duskiſh, ſome greeniſh, ſome watchet, &c.

In faſhion are noted three differences, for either they ſeeme round, with beames round about, or with a beard hanging downeward, or elſe with a taple ſtretched out ſidelong, in length. The firſt faſhion is, when the matter is thickeſt in the middeſt, and thinne round about the edges. The ſecond is, when the Exhalation

lation is upward thick, and in length downeward also, meanely thick. The third forme is like the second, saving that the taple hangeth not downe, but lyeth aside, and is commonly longer than the beard. The time of their generation is oftenest in Autumne or harueſt. For in the ſpring, there is too much moyſture, and too little heate, to gather a Comet. In ſummer, is too much heate, which will diſperſe and conſume the matter that it cannot bee ioyned together. As for winter it is cleane contrary to the nature of a Comet, which is hote and drie winter being cold and moyſt: therefore no time ſo méete as Autumne.

The temper of the 4. quarters.

Now for ſo much as many learned men haue gone about to declare the ſignification of blazing ſtarres, we will omit nothing that hath any ſhadow of reaſon, but declare what is written of them.

The ſignification of Comets.

Such things as are ſet forth of the betokening of Comets, are of two ſortes: the firſt is of naturall, the ſecond of ciuill or politike effects. They are ſaid to betoken drought, barrennes of the earth, peſtilence.

Drought, becauſe a Comet cannot be generated without great heate, and much moyſture

moysture is consumed in the burning of it. Warrennes, because the fatnesse of the earth is drawn up, whereof the Comet consisteth.

Pestilence, for so much as this kinde of Exhalation corrupteth the ayre, which infecteth the bodies of men and beasts.

The second sort might well be omitted, saving that Aristotle himselfe disdaineth not to seeke out causes for some of them. Generally it is noted of all Pillorographers, that after the appearing of Comets, most commonly follow great and notable calamities. Besides this, they betoken (say some) warres, seditions, changes of common wealths, and the death of Princes and noble men. Aristotle.

For what times Comets do shine, there be many hote and dry Exhalations in the ayre, which in dry men kindle heat, whereby they are provoked to anger: of anger commeth brawling, of brawling fighting & warre, of warre, victory: of victory, change of common wealths. Then also Princes living more delicately than other men, are more subiect to infection, therefore die sooner than other men. If it were lawfull to reason of this sort, we might enduce them to betoken not only these few things, but all other things that chance in the world. Yet

Yet these predictions have a shew of reason, though it be nothing necessary: but it is a word, to see, how the Astrologians dote in such devices. They are not ashamed, to an earthly substance, to ascribe an heavenly influence, and in order of iudgment to use them as very starres. Surely, by as good reason as to the celestiall starre, they attribute divine influences and effects. But this their folly hath been sufficiently detected by divers godly and learned men, and this place requireth no long discourse thereof. Wherefore this shall suffice, both for the naturall causes of blazing starres, and also, for all flames in generall. It followeth therefore, that with like brevity we declare the causes of fiery apparitions.

Of Apparitions.

Apparitions.

AN Apparition, is an Exhalation in the lowest or highest region of the ayre, not verily burning, but by refraction of light either of the Sunne or the Moone, seemeth as though it burned. Which appearance of colour, riseth not of the mixtion of the foure qualities, as it doth in bodies perfectly mixed, as hearbes, stones

stones, &c. but onely the falling of light upon shadow. The light is in stead of white, & the shadow or darknes in stead of black. These diversly mixed according to the divers disposition of the Exhalation, which ministreth variety by thicknesse or thinnesse, causs divers colours.

There bee commonly recited three kinds of fyry apparitions.

Colours, wide gapings, and deepe holes, which appeare in the clouds.

Of colours.

COlours are heere meant, when there is nothing else to be noted, but the colours of the clouds, and they are caused (as it is said) by casting the light into the shadowy cloud, according as it exceedeth more or lesse in thicknesse, whereof some be very bright white, and that is when the Exhalation is very thin: some yellowish, when the Exhalation is thicker: some ruddy, when it is meanly thick; and very black, when it is very thick. The red and ruddy colours are seen only in the morning and evening, when the light of the Sunne is not in his full force, for at other times of the day, his light is so vehement, cleare, strong, and pearcing. Thus much of colours. Colours in the ayre.

Of wide gaping.

Wide gaping of clouds in the ayre.

WIde gaping is causeD, when an Exhalation is thick in the midst, and thin on the edges, then the light being receiued into it, causeth it to appear as though the sky did rend, and fire breake out of it.

Of round opening Hiatus.

Round opening in the ayre.

THese holes called Hiatus, differ from wide gapings, in nothing, but that they be lesse, and therefore seeme as though they were deepe pits or holes, and not rending or gaping, and these be those apparitions that appeare fiery, & yet be not so indeed. Therefore let this be sufficient to haue shewed the naturall causes of all fiery Meteors.

The third Booke of Ayry impressions.

VNder the name of ayry impressions, be comprehended such Meteors, whose matter is most of the aire. Of this sort be windes, earthquakes, thunder, lightnings storme, winds, whirlewinds, circles, rainebowes, the white circle, called of some, Watling street, many Sunnes, many Moones.

Of

Of Windes.

THe wind is an Exhalation hot and dry, drawn up into the ayre by the power of the Sun, & by reason of the waight thereof being driven downe, is laterally or sidelongs caried about the earth, and this definition is to be understanded, of generall winds that blow over all the earth, or else some great regions: but besides these, there be particular winds, which are knowne but only in some countries, & them not very large: these winds oftentimes have another maner of generation, & that is on this manner. It must nedes be confessed, that within the globe of the earth, be wonderful great holes, caves, or dungeons, in which when ayre abounded (as it may by divers causes) this ayre that cannot abide to be pinned in findeth a little hole, in or about those countries as it were a mouth to breake out of, and by this meanes bloweth vehemently: yet that force & vehemency extendeth not farre, but as the wind that commeth forth of bellowes, nere the comming forth is strong, but far of, is not perceived. So this particular wind, in that country where it breaketh forth, is very violent & strong, in so much, that it overthrowth both trees

Windes.

The second kind of winds.

and houses, yet in other countries, not very farre distant, no part of that boysterous blast is felt. Wherefore this wind differeth from the generall winds both in qualities and substance or matter: for the matter of them is an Exhalation, and the qualities such as the nature of the Exhalation is, very ayry, but not ayre indeede: but of this particular wind, the matter and substance is most commonly ayre.

The third kinde of winde.

There is yet a third kinde of winds, which is but a soft gentle and cole moving of the ayre, and commeth from no certaine place (as the generall wind doth) yea, it is felt in the shaddow under Trees, when in the hote light and shining of the Sunne, it is not perceived. It commeth whisking suddainely, very pleasant in the heate of the Summer, and ceaseth by and by. This properly is no mind, but a moving of the ayre by some occasion. As for the generall winds, they blow out of divers quarters of the ayre now East, now West, now South, now North, or else enclining to one of the same quarters. Among which the East-winde following the nature of the fire, is hote and drie, the South-wind expressing the qualitie

lity of the ayre, is hote and moyſt, the Weſterne blaſts, agreeing with the waters property, is cold and moyſt. The Nouth, that never was warmed with the heat of the Sunne, being cold and dry, partaketh the conditions of the Earth. The middle windes haue middle and mixed qualities, after the nature of those foure principall windes more or leſſe, as they encline toward them more or leſſe. The qualities of the winds and the foure quarters of the world. The quality of middle wind.

Generally the profit of all windes, by the wonderfull wiſdome of the Eternall God, is wonderfull great, unto his creatures. For beſides that theſe windes alter the weather, ſome of them bringing raine, ſome drineſſe, ſome froſt and ſnow, which all are neceſſary, there is yet an univerſall commoditie, that riſeth by the only moving of the ayre, which were it not continually ſtirred, as it is, would ſome putrifie, and being putrified, would be a deadly infection to all that hath breath upon the Earth. Wherefore this winde, whoſe ſound we heare, and knowe not from whence it commeth, nor whither it goeth (for who can affirme from whence it was raiſed, or where it The profit of wind. John. 3.

is laid downe: (as all other creatures beside doe teach us the wonderfull and wise prouidence of God) that we may worthily cry out with the Psalmist, and say: O Lord, how manifold are thy workes, in wisedome hast thou made them all, &c. Let this be sufficient to have shewed the generation of the winds.

Psal. 104

Of Earthquakes.

Earthquakes.

AN earthquake is a shaking of the earth which is caused by meanes of winde & Exhalations, that be enclosed within the caues of the earth, and can find no passage to breake forth, or else so narrow a way that it cannot come enough bee deliuered. Wherefore, with great force and violence it breaketh out: and one while shaketh the earth, another while rendeth and cleaueth the same: sometime it casteth up the earth, a great height into the ayre, and sometime it causeth the same to sinke a great depth downe, swallowing both Cities and Townes, yea and also mighty great Mountaines, leauing in the place where they stood, nothing but great holes of an vnknowne depth, or else great lakes of waters.

Of

Of divers kinds of Earthquakes.

Divers kinds of Earthquakes.

DIvers Authors write diverſly, of the kinds of earthquaks, ſome making more and ſome leſſe, but we ſhall be content at this time to comprehend them in foure ſorts.

The firſt kinde is when the earth is ſhaken laterally, to one ſide, which is, when the whole force of the winde, driveth to one place, and there is no other contrary motion to let it. This winde, if it be not great, ſhaketh the earth, that it trembleth as a man that hath a fit of an ague, and doth no more harme: but if it be great and violent, it looſeth the foundations of all buildings, be they never ſo ſtrong, and overthroweth whole Cities, but eſpecially the great buildings, and not only ſuch buildings, but ſometimes alſo caſteth downe great Hilles, that cover and overwhelme all the valley under them. Many noble and great Cities have been overthrowne by this kinde of earthquake. It is written, that twelve of the moſt beautifull Cities, and moſt ſumptuous buildings in all Aſia, where overthrowne and utterly

Twelue Cities overthrowne with one earthquake.

destroyed with an earthquake. How often Antiochia Pea, within short time was destroyed, they which have read the Histories, can testifie. How terrible was the earthquake that shoke Constantinople a whole yere together, that the Emperour, and all the people, were faine to dwell abroad in the fields, under tents and pavilions, for feare their houses would fall on their heads, it is recorded in Chronicles, and worthy to be remembred.

Constantinople the chiefest citie of Greece, now the Turkes Palace.

The second kinde is, when the earth with great violence is lifted up, so that the buildings are like to fall, and by and by sinketh downe againe: this is, when all the force of the windes striveth to get upward, after the nature of Gunpowder, and finding some way to be delivered out of bondage, the earth that was hoysed up, returneth to his ole place.

The second kind.

The third kinde is a gaping, rending, or cleaving of the earth, when the earth sinketh downe, and swalloweth up Cities, and Townes, with Castles, and Towers, Hilles and Rockes, Rivers, and Flouds, so that they be never seene againe. Yea the Sea in some places hath beene drunke

The third kind.

Earthquake on the Sea.

drunke up, so that men might have gone ouer on foote, untill the time of tyde or flood returning couered the place with waters againe. But in the land, where this earthquake swalloweth up any City, or Country, there appeareth nothing in the place thereof, but a marueilous wide and deepe gulfe, or hole, Aristotle maketh mention of diuers places, and regions that were ouerthrowne with this kinde of earthquake. Aristot.

The fourth kinde, is when great mountaines are cast up out of the earth, or els when some part of the land sinketh downe, and in stead thereof arise Riuers, Lakes, or Fires breaking out with smoake and Ashes. It causeth also ouerflowings of the Sea, when the Sea bottome is lifted up, and by this meanes arise many Ilands in the Sea, that neuer were seene before. These and other such miracles, are often to be found in the writers of Histories, also in the Philosophers, as Aristotle, Seneca, and Plinius. The fourth kinde. New Ilands in the Sea. Arist: Seneca. Plinius.

Nevertheleſſe, the effects of some as most notable, it shall not be unprofitable to recite. Plato in his Dialogue, intituled Timeus, maketh mention by the way Cato.

of

A wonderfull earthquake.

of a wonderfull earthquake, whereby not only Africa was rent asunder from Europe and Asia (as it is indeed at this day, except a little neck by the red Sea) the Sea entring betweene them that now is called Mare mediterraneum: but also a wonderfull great Iland, which he affirmeth, was greater then Africa and Asia both, called Atlantis, was swallowed up, and covered by the waters, in so much, that on the Sea called Atlanticum, for a great while after, no Shippe could saple, by reason that the same huge Sea, by resolution of the earth of that mighty Iland, was all turned into mudde. The famous Ile of Sicilia was also sometime a part of Italy, and by earthquake rent asunder from it. Seneca maketh mention of two Ilands, Theron and Therea, that in his time first appeared. It should seeme both by Aristotle, and also by Herodotus, that Egypt, in ancient time, was a goulph of the Sea, and by earthquake made a drie land. During the reigne of Tiberius the Emperour, twelve notable Cities of Asia were overthrowne in one night, &c.

Africa, Europa, Asia, the three parts of the earth.

Mare mediterraneū, because it goeth thorow the midst of the earth.

Atlantis an Iland.

Seneca.

Theron & Therea.

Arist. Herodotus.

Egypt sometime a goulph of the Sea.

How

How so great winds come to be under the Earth.

The great Caves and Dennes of the Earth, must needs be full of ayre continually: but when by the heate of the Sunne, the moysture of the Earth is resolved, many Exhalations are generate as well within the Earth, as without, and whereas the places were full before, so that they could receive no more, except part of that which was in them, no; let out, in such countries, where the Earth hath few pores, o; else where they be stopped with moysture, it must needs follow, that these Exhalations striving to get out, must needs rend the Earth in some place, o; lift it up, so that either they may have free passage, o; else room enough to abide in.

Of the signes and tokens that goe before an earthquake most commonly.

The first is the raging of the Sea, when there are no tempestuous winds to stirre it, yea, when the ayre is most calme without winds. The cause why the Sea then rageth, is, that the wind beginneth to labour for passage, that

The signes of an earth quake.

that way, and finding none is sent back, and some after maketh the land.

The second signe is calmnesse of the ayre, and cold, which commeth to passe, by reason that the Exhalation, that should be abroad, is within the earth.

The third signe, is said to be a long thinne strake of cloud seene, when the skie is cleare, after the setting of the Sunne. This (say they) is caused, by reason that the Exhalation or vapor, which is the matter of cloudes, is gone into the earth. Other affirme, that it is the Exhalation that breaketh out of some narrow hole of the earth, out of which the rest of the wind cannot issue, neither will it waite the time: wherefore within a while after, it seeketh and maketh it selfe, by sudden eruption, a broader way to be delivered out of prison.

Also the Sunne, certaine daies before it appeareth dimme, because the winde, that should have purged and dissolved the grosse ayre, that causeth this dimnesse to our eyes, is enclosed within the bowels of the earth.

The water in the bottome of deepe welles is troubled, and the savour thereof infec-

infected, because the pestilent Exhalations ỹ have bẽ long inclosed within the earth, doe then beginne a little to be sent abroad. For thereof commeth it, that in many places where earthquakes have beene, great abundance of smoke, flame, and ashes, is cast out, when the abundance of brymstone that is under the ground, through violent motion is set on fire, and breaketh forth. Finally, who knoweth not, what stinking minerals and other poysonous stuffe doe grow under the earth? wherefore it is no wonder, if well-water, before an earthquake, be infected: but rather it is to be marveiled, if after an earthquake, there follow not a grievous pestilence, when the whole masse of infection is blown abroad.

Last of all, there is heard before it, in the time of it, and after it, a great noise and sound under the earth, a terrible groaning, and a very thundering, yea, sometimes when there followeth no earthquake at all, when as the winde, without shaking of the earth, findeth a way to passe out at. And these for the most part, or at least some of them, are forewarnings, that the most fearefull earth-

Thundering under the earth.

earthquake will follow, than the which
Cato. there is no naturall thing, that bringeth men into a greater feare. Cato was very curious to confesse himselfe, that he repented, that ever he went by water, when as he might have gone by land. But what land can be sure, if it be the Lords will, by this worke of his to shake it? what building so strong, that can defend us, when the more strong the more danger, the higher, the greater fall.

Of Thunder.

Thunder. THunder is a sound caused in the clouds by the breaking out of a hote & drie Exhalation, beating against the edges of the cloud. It is often heard in spring & summer by reason that the heat of the sun then draweth up many Exhalations, which meeting in the middle region of the ayre, with cold & moist vapors, are together with them, inclosed in an hollow cloud: but when the hot Exhalation cannot agree with the coldnesse of the place, by this strife being driven together made stronger and kindled, it will never breake out, which sudden & violent eruption causeth the noyse which we cal thunder. A similitude is put by great authors, of moist wood that cracketh

A simili tude.

in

in the fire: we may adde hereunto the breaking of an egge in the fire, of an apple, or any like thing: for whatsoever holdeth and withholdeth enclosed any hote wind, so that it can have no vent, it will seeke it selfe a way, by breaking the skin, shell or case. It were no ill comparison, to liken thunder to the sound of a gunne, which be both caused of the same or very like causes.

The sound of thunder is divers, after which, men have devided the thunder into divers kinds, making first 2 sorts, that is, small thunder & great. But as for the diversity of sounds, generally it comes of the divers disposition of the cloude, one while having more holes than at another, sometime thicker in one place, than in another. The small or little thunder, is when the Exhalation is driven from side to side of that cloud, making a noyse, & either for the small quantity, & lesse forcibleness, or else for the thicknes of the clouds wals, is not able to breake them, but rumbleth up & downe within the cloud, whose sides be stronger than the force of the Exhalation is able to breake, it rumneth up & down within, & striking against the cloud & moist sides, maketh a noyse, not unlike to the quenching of hote iron in cold water.

Divers kinds of Thunder.

Small Thunder, and the kinds thereof.

And

And if the Exhalation be meanly ſtrong, and the cloud not in all places of like thickneſſe, it breaketh out at thoſe thin places with ſuch a buzzing, as wind maketh blowing out of narrow holes.

But if the cloud be ſo thinne, that it cannot keepe in the Exhalation, although it be not kindled, then it bloweth out with like puffing, as wind commeth out of a payre of bellowes.

Great thunder and the kinds thereof

A great thunder, is when the Exhalation is much in quantity, and very hote and drie in quality, the clouds alſo very thick and ſtrong, that eaſily will not give place to the wind, to eſcape out.

Wherefore if the Exhalation doe vehemently ſhake the cloud, though it doe not at the firſt diſperſe it, it maketh a long and fearefull rumbling againſt the ſides of the cloud, untill at the laſt being made ſtronger by ſwifter motion, it diſſolveth the cloud, and hath liberty to paſſe out into the open ayre. The cloud diſſolved, droppeth downe, and then followeth a ſhowre of raine.

Otherwhyles it ſhaketh the cloud, not long, but ſtraightway rendeth it a long

long ſpace and time, whoſe ſound is like the rending of a broad cloth, which noyſe continueth a pretty while.

And ſometime it diſcuſſeth the cloud at once, making a vehement and terrible crack like a gunne, ſometime with great force caſting out ſtones: but moſt commonly fire, which ſetteth many high places on fire. As in the yeare of our Lord, 1561. the fourth day of June, the ſteeple of Saint Pauls church in London was ſet on fire, as it hath beene once or twice before, and burned.

The noyſe of thunder, though it be great in ſuch places over which it is made, yet is it not hard farre off, eſpecially againſt the winde. Whereof we had experience, alſo in the yeare of our Lord, 1561. on Saint Matthias day in February, at the eneming, when there was a great flaſh of lightning, and a very terrible crack of thunder following, they that were but two miles from London Weſtward, heard no noyſe, nor ſound thereof: the winde that time was Weſterne. How farre thunder is heard.

The effect of thunder is profitable to men; both for that the ſweete ſhowre doth follow it, and alſo for that it pur- The profit of thunder.

geth and purifieth the ayre, by the swift moving of the Exhalation that breaketh forth, as also by the sound, which dividing and pearcing the ayre, causeth it to be much thinner: which may be verified by an History that Plutarchus in the life of T. Quincius Flaminius reporteth, that there was such a noyse made by the Grecians, after their liberty was restored, that the Birds of the ayre that flew over them were seen to fall down, by reason that the ayre divided by their cry, was made so thinne, that there was no firmity or strength in it to beare them up. And let this suffice for Thunder, whom lightning succedeth in treaty, that seldome is from it in nature.

Plutarchus. T. Quincius Flaminius.

Of Lightning.

Lightning.

AMong the divers kinds of lightning, which writers in this knowledge doe number, we shall entreat only of foure kindes, yet so that under these foure, all the rest may be comprehended. The names we must borrow of the Latine tongue. The first is Fulgerum. The second Corusatio, the third Fulgur, the fourth Fulmen.

Fulgerum. Corusatio. Fulgur Fulmen.

Of

Of Fulgetrum.

Fulgetrum we call that kinde of lightning, which is sæne on summer nights and evenings, after a hote day. The generation hereof is such, when many thinne, light and hote Exhalations, by the immoderate heate, habe bæne drawne up from the earth, and by the absence of the sunne be destitute of the force, whereby they should habe bæn drawne further upward, yet something ascending by their owne nature, in that they be light and hote, they mæte with the cold either of the night, in the lowest region, or else of the ayre, in the middle region, and so by resistance of contraries (as it hath bæne oft before rehearsed) they are beaten back, and with the vehement moving set on fire. This lightning commonly goeth out in the ayre, terrible to behold, not hurtfull to any thing: Except sometime, when the matter of it is earthy and grosse being striken downe to the earth, it blasteth corne, and grasse, with other small hurt. Sometime it setteth a barne or thacked house on fire. The colour of this lightning, as of all other, is divers, partly Fulgetrum.

The colour of this lightning.

partly according to the matter, and partly according to the light. If the matter be thinne, it is white, if the substance be grosse, it is ruddy, like flames of fire: in great light, as in the day, it appeareth white, in the night, ruddy: yet sometime in the day time, we may see it yellow, which is a token that the matter is wonderfull thick & grosse. Old wives are wont to say, that no night in the yere, except one, passeth without lightning: but that is true, as the rest of their tales, whereof they have great store.

Of Coruscation.

Coruscation. Coruscation is a glistering of fire, rather than fire indeed, and a glimmering of lightning rather than lightning it selfe: which is two manner of wayes; one way, when clouds that be lower than the upper part of the earth, without the compasse of our sight, are enflamed: and the reflexion of that flame is cast up into our sight, appearing in all points like lightning, saving that the ayre, where it appeareth, is so cleare, that we are perswaded, no lightning can be there caused. Another way, is when there be thick cloudes over us, and commonly a double order of cloudes, one above

abode an other: if lightning or any other inflamation be in the upper part of these clouds, the light of them pierceth thorow the lower parts, as thorow a glasse, and so appeareth, as though it lightned, when perhaps it did lighten indeed: yet that which wee saw, was but the shaddow thereof. And this is often without thunder.

Of Fulgur.

FUlgur is that kinde of lightning which followeth thunder, whereof we have spoken before. For when that violent Exhalation breaketh forth, making a noyse as it beateth against the sides of the cloud, with the same violence it is set on fire, and casteth a great light, which is seene, farre & neere. And although the lightning appeare unto us, a good pretty while before the thunderclap be heard, yet it is not caused before the noyse, if any thunder at all doe follow, but either is after it or with it. Wherefore that we see it, before we heare the thunder, may be ascribed, either to the quicknes of our sight, that preventeth the hearing, or else to the swift moving of

Fulgur.

The lightning is not before the thunder, though it seem so.

Sight preventeth hearing.

the fire and the light thereof, to our eyes and the flow moving of the sound, unto our eares and hearing. These three kinds of lightnings are more fearefull than hurtfull, but the fourth seldome passeth without some dammage doing.

Of the fourth kinde, called Fulmen.

The most dangerous, violent and hurtfull kind of lightning is called Fulmen, whose generation is such as followeth. What time a hote Exhalation is enclosed in a cloud and breaking the same, bursteth forth, it is set on fire and with wonderfull great force stricken downe toward the earth. The crack of thunder that is made when this lightning breaketh out, is sudden, short, and great, like the sound of a Gunne. And oftentimes a great stone is blowne out with it, which they call the thunder-bolt, which is made on this manner. In the Exhalation which is gathered out of the earth, is much earthly matter, which clottering together by moysture, being clammy by nature, consisting of brimstone, and other metallike substance by,

The thunder Bolt cast out of the clouds.

by the excellive heate, is hardened as a brick is in the fire, and with the mighty force of the Exhalation strongly cast toward the earth, and striketh downe steeples, and high buildings of stone, and of wood, passeth thorow them, and setteth them on fire, it cleaveth trees and setteth them on fire: and the stronger the thing is that resisteth it, the more harme it doth to it. It is sharpe pointed at one end, and thick at the other end, which is caused by reason that the moyster part, as heavier, goeth to the bottome of it, so is the top small, and the bottome thick.

Strongest things are most hurt of lightning.

Men write, that the thunderbolt goeth never above five foote deepe, when it falleth upon the earth: which standeth with reason, both because the strength of it is weakened, before it come so neere the ground, and also, because the continuall thicknesse of the earth breaketh the force, were it never so great.

How deep a thunder-Bolt goeth into the earth.

Both Aristotle, Seneca, and Plinius divide this lightning into three kinds.

Arist. Seneca. Plinius.

Of the first.

The first is dry, which burneth not, to be felt, but divideth, and appeareth

Dry lightning.

with wonderfull swiftnesse. For being subtill and pure, it passeth thorow the pores of any thing, be they never so small, and such things, as give place unto it, it burteth not, but such things as resist, it dividеth and pierceth. For it will melt money in mens purses, the purses being whole and unharmed. Yea, it will melt a sword in the scabberd, and not hurt the scabberd at all. A wine vessell it will cleave, and yet the wine shall be so dull, that by the space of three dayes, it will not runne out. It will hurt a mans hand, and not his glove. It will burne a mans bones within him to ashes, and yet his skinne and flesh shall appeare faire, as though nothing had come to him. Yea, otherwise the whole man in the moment of an houre shall be burned to ashes, whereas his clothes shall not seeme to have been touched. It will also kill the child in the mothers belly, and not hurt the mother: And all because the matter is very subtill, and thinne, burning, and passing thorow whatsoever it be, that will not give it free passage.

Money molten in mens purses, and swords in scabberds.

Of the second kinde.

Moyst lightning.

The second kinde is moyst, and because it is very thinne, it burneth not to

to ashes, but onely blacketh or scorcheth trees, corne and grasse: and by reason of the moystnesse, it maketh all things black that it commeth nere, as moyst wood burning, is smoaky, and maketh things nere it to be black and smoaky. Why it maketh black.

Of the third kinde.

The third kinde is most like our common fire that wee have here on the earth of grosse and earthly substance, wherefore it leaveth a print where it hath been, or else consumeth it into ashes, if it be such a body as will be burned with fire. Grosse lightning.

Of the marvailes of lightning, and their causes.

Beside the wonderfull effects of lightning, that have been already remembred, there be many other which hereafter ensue, with the reason and causes unto them belonging, as thus: The marvell of lightning.

The nature of lightning is, to poyson beasts, that are stricken therewith, as though they had been bitten by a Serpent. The cause of this is, that the matter of lightning is much infected with Lightning poysoneth

Brim-

Brimstone, and other poysonous metallike substances, which will poyson the rather in lightning, because it is thinne, and giveth them passage into every part of the body.

Seneca. Wine not running, the vessels being broken.

It is notable, that Seneca writeth, how wine vessels of wood being burned with lightning, the wine would stand still, and not runne out: the reason hereof, is the swift alteration and change, whereby also all the clammineese of the wine is drawne to the outwardmost part, and so keepeth in the wine, as in a skinne, that by the space of three dayes it will not run. It will also poyson wine, insomuch that they which drinke thereof, shall either be madde, or dye of it: the cause hereof was set forth before.

Lightning purgeth a poysonous beast.

Lightning that striketh a poysonous beast, purgeth it from the poyson, in so much, that it causeth a Serpent or snake which it killeth, to breede wormes, which otherwise it would not doe, but being purged from the naturall poyson, by the swift pearcing of the lightning, nothing letteth, but that it may breede wormes, as all other corrupt flesh will doe.

A Snake breedeth no Worms

It

If lightning strike one that sleepeth, it openeth his eyes, and of one that waketh, it shutteth the eyes. The cause is this, that it waketh him that sleepeth, and killeth him, before he can close his eyes againe. And him that waketh, it so amazeth, that he winketh, as he will doe at any sudden chance: so hee doeth, before he can open his eyes againe. Lightning openeth his eyes that sleepeth and closeth his that waketh

All living things turne their face toward the stroke of the lightning, because it is their nature, to turne their head if any thing come suddenly behind them. The rest that have their face toward it, when it commeth, never turne before they be killed. Living things turne their face toward lightning.

The reason why it killeth the child in the mothers wombe, not hurting the mother, is the tendernes of the one, and the strength of the other, when the lightning is not vehement, otherwise both should die together.

Sometime lightning burneth only the garments, cloaes, or hayre of men, not hurting their bodies, and then the Exhalation is nothing vehement. Sometime it killeth a man, & there appeareth no Garments burnt, the body unhurt.

wound

wound without, neither any hurt within, no not so much as any signe of burning: for then the Exhalation, which being kindled, is called lightning, is wonderfull subtill and thinne, so swiftly passing thorow, that it leaveth no marke or token behind it.

Lightning causeth blindnesse, swelling or Lepresie.

They that behold the lightning, are either made blinde, or their face swelleth, or else become Lepers, for that fiery Exhalation, receyved into the pores of their face and eyes, maketh their face to swell, and breake out into a Lepresie, and also dryeth up the Christalline humour of their eyes, so that consequently they must needs be blind.

Eutropius. Marcus Tullius Cicero.

Eutropius sheweth, that the same day, in which Marcus Tullius Cicero was borne, a certaine Virgine of Rome riding into Apulia, was stricken with lightning, so that all her garments being taken from her without any rending, she lay starke naked, the lasing of her brest being undone, and her hose garters untyed, yea, her bracelets, collars, and rings being all losed from her. Likewise her horse lay dead, with his bridle and girtes untyed.

Apulia.

The

The places of them that are burnt with lightning, are colder than the rest of their bodies, either because the greater heat drieth away the lesser, or else because that by the great violence, the vitall heat is quite extinguished in that place. The wounds of lightning cold.

The Sea-Calfe is never hurt with lightning: wherefore the Emperours Tents were wont to be covered with their skinnes. Sea Calfe not hurt with lightning.

The Bay Trees, and Box Trees, are never, or seldome striken with lightning. The cause of these may be, the hardnesse of their skinne, which hath so few poore holes, that the Exhalation cannot enter into them. Bayes and Box Trees seldome hurt with lightning.

The Eagle also among fowles, is not striken with lightning. Wherefore the Poets fayne, that the Eagle carrieth Jupiters armour, which is lightning. The reason may be the thicknesse and drynesse of her feathers, which will not be kindled with so swift a fire. The Eagle Jupiters harnesse-bearer.

Of storme Winds.

A Storme wind, is a thick Exhalation, violently moved out of a cloud, without inflammation or burning: the matter Storme winds.

ter of this kynde is all one with the matter of lightning, that hath beene spoken of: namely, it is an Exhalation very hote and drie, and also grosse and thick, so that it will easily be set on fire: but then, it hath another name, and other effects.

The forme or maner of the generation is such: When abundance of that kinde of Exhalation is gathered together, within a cloud, which needs will have one way out or other, it breaketh the cloud, and causeth thunder, as it hath beene taught before: but if the matter be very thick, and the cloud somewhat thinne, then doth it not rend the cloud, but falling downe, beareth the cloud before it, and so is carried, as an arrow out of a bow. It doth allwayes goe before a great sudden showre; for when the cloud is broken the water must needs fall downe. Also it is so grosse, and so thick, that it darkneth the ayre, and maketh all the lowest region of the ayre, to be in maner, as a darke smoaky cloud. It causeth tempest in the Sea, and wonderfull great danger to them that beare saple, whom if it overtake, it bringeth to utter destruction.

So sudden is this kind, that it cannot be resisted

resisted with sudden helpe.

So violent it is, that feeble force cannot withstand it.

Finally, it is so troublesome with thunder, lightning, rayne, and blast, besides these, darkenesse and cold, that it would make men, at so neere a pinch, to be at their wits end, if they were not accustomed to such tumultuous tempest.

Wherefore it were profitable, to declare the signes that goe before it, to the end men might beware of it.

But they are so common to other tempests, that either they are knowne well enough, or else being never so well known, in a seldome calamity, they would little be feared.

The Sea Ships subiect to more danger, have more helpe, if it bee used in time: but no signes foreknowne, can profit the dweller of the land, to keepe his house from ruine, except it were to save his life from the fall of his mansion.

The sudden violence of this tempest to him, is more seldome times, but more incurable, when it commeth, than to the Marryner, who hath some ayde

to

to look for, by his comming: the other, if he escape with his life, may comfort himselfe, that he was neere a great danger, and cast with himselfe to build up his house againe.

Of whirlewinds.

Whirlewinds.

A Whirlewind, is a wind breaking out of a cloud, rowling or winding round about, overthrowing that which standeth neere it, and that which commeth before it, carrying it with him aloft in the ayre.

It differeth from a storme wind in three points.

First in the matter which is lesse in quantity, and of thinner substance.

Secondly, in the moving, which is circular, winding about, whereas the storme bloweth aslope and sidelongs. Also a whirlewinde, in the moving divideth not it selfe abroade, and bloweth directly as the storme doth.

And thirdly, in the manner of the generation: for a storme doth alwayes come out of one cloud, but a whirlewind sometime is caused by meanes of two contrary windes that meete together.

In like manner as we see in the streets of

of Cities, where the wind is beaten back from two walles, meeting in the middest of the ſtreet, there is made a little whirlewind. which whiſking round about, taketh up the duſt, or ſtrawes, and bloweth it about, after the very ſimilitude of the great and feareſull whirlewind.

The reaſon of the going about, is this, that when the walles beat back the wind from them, which abounderh in that place, and thoſe windes, when they meete, by reaſon of equall force on both ſides, can neither drive one the other back againe, nor yet paſſe thorow one the other, it muſt nedes be, that they muſt both ſeeke a way on the ſide at once, and conſequently, be carried round about, the one, as it were, purſuing the other, untill there be ſpace enough in the ayre, that they may be parted aſunder.

The matter of a whirlewind, is not much differing from the matter of ſtorme and lightning, that is, an Exhalation hote and drie, breaking out of a cloud, in divers partes of it, which cauſeth the blowing about. Alſo it is cauſed, as it hath beene ſayd, by two, or more windes, blowing from divers places,

which may be of particular causes, that have bene shewed before in the Chapter of windes. This tempest is noysome to man and beast, Sea and Land, things living, and life lacking: For it will take up both men and beasts, stones & clods of earth: which when it hath borne a great way, will not be so courteous, as to set them downe againe, but negligently letteth them fall from a great height, or else violently throweth them downe to the earth.

The troubles of whirlewinds.

It breaketh Trees, winding them about, and pulling them up by the rootes. It turneth about a Ship, and burseth it in peeces with other mischiefes besides.

Of fired whyrlewinds.

Fired whirlwinds.

SOmetime a whirlewind is set on fire within the cloud, & then breaking forth, fyeth round like a great cart-wheele, terrible to behold, burning and overthrowing all drie things that it commeth neere, as houses, woods, corne, grasse, and whatsoever else standeth in the way.

It differeth not from a whirlewind, saving that it is kindled and set on fire, & appearing, else the generation of both

called one.

Of Circles.

The Circle called Halon is a garland of divers colours that is seen about the Sunne, the Moone, or any other Starre, specially about Jupiter or Venus, for their great brightnesse. It is called of the Greeks a compassed plat, of the Latines, a crowne or garland. Circles about the Sunne, the Moone, and other Starres, Jupiter & Venus Planets.

The matter wherein it is made, is a cloud of equall thicknes, or thinnesse, comming directly under the body of the Sunne, the Moone, or other Starres, into which, the light of the heavenly body is received, and so appeareth round, because the Starre is round: or as a stone cast into the water, maketh many round circles, dilating in breadth, untill the violence of the moving is ended; so is it in the ayre, the light beams piercing it, cause broad circles to be dilated, which appeare white, purple, black, red, green, blew, and other colours according to the disposition of the clouds matter. The cause of such colours, is shewed before, in the peculiar treaty of colours. Circles in the water. The colours of circles.

This circle is oftner seene about the Moone, than about the Sunne, because

the heate of the Sunne draweth the vapors too high, where it cannot be made. Also, because the night is a more quiet time than the day, from winde, it is more often in the night, than in the day. Seldome, about other Starres, because their light beames, are too weake often to pierce a cloud: yet oftner about small starres than the Sunne, because the light of the Sunne pierceth the cloud more forcibly, than that this Halon can many times be cause.

Circles about a candle.

Otherwhiles it is seene about a candle, which must be in a very thick and grosse ayre of such proportionate thicknesse, that it may receive the light as the cloud doth from the Starres, as in the smoaky places, or hote houses.

This kinde of circle is sometimes like a Rainebow, saving that it is a whole circle, unlesse the Starre under which it is caused, be not all risen, or else the cloud, in which it is seene, be not all come under the Starre, or after it hath come under some part thereof, be dissolved from the rest.

The signs of these circles.

Virgilius, Aratus, Poets.

These Circles be signes of tempests and windes, as witnesse both Virgil, & Aratus.

The

The winde shall blow from that quarter, where the Circle first beginneth to breake. The cause whereof is this, that the Circle is broken by the winde that is above which is not yet come downe towards us, but by this effect above, wee may gather, both that it will come, and also from what quarter.

A great Circle about the Moone, betokeneth great cold and frost to follow after. Signe of frost.

But if it vanish away and bee dissolved altogether, it is a signe of faire weather. Signe of faire weather.

If it be broken in many partes, it signifieth tempest. Signe of tempest.

If it ware altogether thicker and darker, it is a forewarning of rayne. Signe of rayne.

One alone, after Ptolomee, pure and white, vanishing away by little and little, is a token of faire weather. Ptolemeus Signe of faire weather.

Two or three at once, portendeth tempest: if they be ruddy, they shew wind to come; and towards snow, they seeme as it were broken and rocky.

Being darke or dimme, they signifie all these foresaid events, with more Signe of Snow.

force and abundance: it is oftener caused in Autumne and Spring, than in Winter or Summer: the cause is the temperatenesse of the time.

The cause why it appeareth sometime greater, and sometime lesser, is in the quality of the matter, which as it is grosse or thinne, will more or lesse bee dilated and stretched abroad, and also as some will have it, of the weakenesse of mens sight. Of which, Aristotle bringeth an example in one Antipho, which did alwayes see his owne image before him in the ayre, as in a glasse: which he affirmeth to have beene for the weakenesse of his sight beames, that could not pierce the ayre, so that they were reflected againe to himselfe.

Aristotle. Antipho.

And thus much for Halon, and the causes, signes, or tokens of it.

Of the Rainebow.

Raynebow

The Raynebow, is the apparition of certaine colours in a cloud, opposite against the Sunne, in fashion of halfe a Circle. Possidonius said, it was the Sunnes loking glasse, wherein his image was represented, and that the blue colour, was

Possidonius.

the

the proper colour of the cloud; the red, of the Sunne; all the other colours of commixtion.

It differeth manifoldly from Halon: for the Rayne bow is alwayes opposite against the Sunne: but Halon is directly under it.

They differ not onely in place, but also in fashion: the Raynebow is but halfe a Circle: the Halon is a whole Circle.

Likewise they vary in colour: for the Rayne bow is more dimme, and of purple colour: the Halon, whiter and brighter.

Also, in continuance, for the Raynebow may continue longer than Halon.

The image of the Rayne-bow may bee seen on a wall, the Sunne striking thorow a sir-pointed stone, called Iris, or any other Christall of the same fashion; also thorow some glasse window. A precious stone called Iris.

Halon is seen about Candles, in smoky places, as are baths and kitchins.

The manner of the generation of the Rayne-bow is such: There is opposite against the Sunne, a thick watery cloud, which is already resolved into

dewy drops of rayne, as (for a grosse similitude) is seen on the potlidde, when the water in the vessell hath sodden, or is very hote, the lidde will be all full of small drops of water, which come from the water in the vessell, first, by heate resolved into smoake, after, when it cannot goe at large, it is resolved againe. Wherefore upon such a cloud, the Sunne beames striking, as upon a smooth glasse, doe expresse the image of the Sunne unperfectly, for the great distance. Or else the Sunne beames striking into a hollow cloud, where they are refracted or broken, and so come to the eyes of him that beholdeth the Raynbow.

A similitude.

The similitude thereof is seene, when men sayle or row in boates, the Sunne shineth upon the water, which casteth on the vessels side, the colours and image of the Raynbow.

The similitude of the Raynbow.

Likewise, water in an urinall holden against the Sunne, receiveth the light, and sheweth colours on the wall.

There be two kinds of Raynbowes, one of the Sunne, another of the Moone; the one by day, the other by night: the Raynebow of the Sunne often, but of the Moone

Raynebow of the Sun, Raynbow of the Moone.

Moone very seldome, in so much that it can be but twice in fifty yeeres, and that when the Moone is in the East or West, full in perfect opposition.

It hath not beene many times seene since the writing of Histories, yet sometimes, and for the rarenesse, is taken for a great wonder. Yet is it in colour nothing so beautifull as the Sunnes, but for the most part white as milke: other diversities of colours are scant perceyved. When it appeareth, it is said to signifie tempest.

The time of the Raynbow is often after the poynt of Autumne, both for the placing of the Sun in competent lownesse, and also for abundance of matter, seldome or never is the Raynbow seene about the midst of Summer.

There may be many Raynbows at one time, yet commonly but one principall, of which the rest are but shadowes and images, the second, shadowy of the first, the third, of the second, as appeares by placing of their colours.

It remayneth, to shew why it is but halfe a circle, or lesse, and never more, and why the whole cloud receyveth not the

same

same colours that the Rayne-bow hath. The cause of the first is, because the center or middle point of the Raynebow, that is diametrally opposite to the center of the same, is alwayes either in the Horizon (that is, the circle cutting off our sight of Heaven by the earth) or under it. The cause why the whole cloud is not coloured, is, because that in the middest, the beames as strong, pearce thorow, but on the edges where they are weaker, they are reflected or refracted.

How farre so much as GOD made the Raynbow a signe and Sacrament of the promise, some thinke it was never seene before the flood: their reason may be this, that the earth, after the first creation, was then so fruitfull, that it needed none, or very little rayne, so that such darke clouds were not often gathered, & fruitfull ground not so easily remitting his moysture, that then was fat and clammy, hard to bee drawn up: so it might be, that there was no Raynebow before, as we cannot finde that ever it rayned before. But whether it was so or not it is certaine, that then it became a Sacrament, whereas it was none before: which when we behold, it behoveth us

ns to remember the truth of God in all his promises, to his glory and our comfort.

The milke way, called of some, the way to S. James, and Watling Streete.

The milke way is a white circle seene in a cleere night, as it were in the firmament, passing by the signes of Sagittarius and Gemini. The white circle seen in the night.

The cause thereof is not agréed upon among Philosophers, whose opinions I thought best to report, before I come to the most probable causes.

Firſt of all, Pythagoras is charged with a Poeticall fable, as though it had béene caused, by reason that the Sunne did once runne out of his pathway, and burned this part, whereof it loketh white. Pythagoras.

Other, as Anaxagoras and Democritus, Anaxagoras. Democritus. ſayd, that it was the light of certaine Starres, shining by themselves, of their owne light, which in the absence of the Sun might be seene. But this opinion is also false, for the Starres have no light of themselves, but of the Sun: also if it were so, it should appeare about other Starres.

Democritus

Democritus is also reported to have said, that it was nothing else but innumerable little Starres, which with their confuse light, caused that whitnesse to this opinion.

Cardanus. Cardan seemeth to subscribe.

The Poets have foure fables of it: one

Phaeton. that Phaeton, which on a time guided the Chariot of the Sunne, and wandring out of the way, did burne that place, wherefore of Jupiter he was stricken downe with lightning.

Ovid. Meta. pr. The second, that it is the high street in Heaven that goeth streight to Jupiters palace, and both sides of it the common sort of gods doe dwell.

Hebe. The third, that Hebe, one which was Jupiters Cupbearer, on a time stumbled at a starre, and shed the wine or milke that was in the cup, which coloured that part of Heaven to this day: wherefore she was put out of her office.

Apollo. The fourth that Apollo stood there to fight against the Giants, which Jupiter made to appeare, for a perpetuall memory.

Theophrastus. Theophrastus, a Philosopher, affirmed, that it was the joyning together, or seame of the two halfe Globes, which made it

appeare

appeare more light in that place than in o-ther.

Other said, it was the reflexion of the shining light of fire or starre light, as it is seene in a glasse, but then it should be moveable.

Diodorus affirmed, that it was Heavenly fire, condensed or made thick, into a circle, and so became visible, whereas the rest, for the pureness, clearness, and thinness, could not be seene. Diodorus.

Possidonius: whose mind to many seemeth very reasonable, said, it is the infusion of the heate of Starres, which therefore is in a Circle, contrary to the Zodiake, (out of which the Sunne never wandreth) because it might temper the whole compasse with vitall and lively heat. Although in my mind he hath rather expressed the finall cause, than the efficient. Possidonius. Zodiake.

Aristotles opinion is, that it should be the beames of a great Circle, which is caused by a cloud or Exhalation drawne up by those Starres, which he called Sporades. This opinion of Aristotles is misliked of most men that have travayled in this science, and worthily: For if it were Aristotle. Sporades.

whereof the nature of elements as Exhalations are, it would be at length consumed, But this circle never corrupteth therefore it is not of Exhalations. Also it neither increaseth nor diminisheth, which is a plaine proofe, that it consisteth not of elementall matter, although Aristotle seem to make a double circle, one celestiall, another elementall.

The last opinion is, of them that say it is of the nature of heaven, thicker in substance, than other parts of Heaven be, having some likenesse to the substance of the Moone, which being lightned by the same as all the Starres be, appeareth white And this opinion I take to be most probable, because that sentence of Star-light seemeth not so reasonably, to be only in that place and not elsewhere.

The finall cause of this milke-white circle, hath beene already touched in the opinion of Posidonius, whereunto also Plinius in the viii. Book and xvii. Chapter of his naturall History agreeth, affirming, that it is very profitable for the generation and fruitfull increase of things that grow on the earth. The Mathematicians that have measured the breadth thereof, affirme that

Posidonius. Plinius.

The breadth of this circle.

that toward the North. it passeth ouer the ecliptical line of the ninth spheare, from the xviii. degree of Gemini, unto the ii. degree of Cancer, which is xiii. degrees and toward the South, from the viii. degree of Sagittarius, to the xiii. degree of the same signe: and because it is there diuided into ii. branches (as may easily be seen in a cleare night) it reacheth from the xviiii of Sagittarius, to the ii. degree of Capricorne.

This circle, if it be of the nature of Heauen, is unproperly placed among Meteors or impressions: but because of Aristoteles mind, who will haue it to be an impression kindled, & their opinion which think it proceedeth of the light of starres, it is not without good cause in this place intreated of.

Of beames, or streames of light, appearing thorow a Cloud.

Beames or streames.

THere is yet another kind of impression caused by the beames of the Sunne, striken through a watery cloud, being of unequall thinnesse, and is thinner in one part than in another, so that it cannot receyue the beames in any other forme, than that they appeare direct or slope downeward of diuers colours, and the same that are the colours of the Rainie bow,

bow, though not so evident, because the reflexion is not so strong. They vary in colours: some are more purple or ruddy, when the cloud is thicker; some yellow: whitish, when the cloud is thinner, and so other colours are caused likewise, whereof you may read the proper cause in the colours of clouds and other like parts of this Treatise.

The common people call it the descending of the holy Ghost, or our Ladies Assumption, because these things are painted after such a sort. Other say that it is raine, striking down in another place, as though they could see the drops falling. And they are not altogether deceyved, but in the time: for sons after, it will rayne, because this impression appeareth out of a watery cloud. They are called by divers names, as rods, wands, cords of Tents, unto which they are not much unlike, staves and little pillers, when they seem greater and thicker, many being ioyned together.

The Raynbow, the circles, and these light beames, are all of one maner of generation, in so much that if you divide the circle, it shall be a Raynbow, if you draw it streight in length, it maketh streames or beames.

beames. Herein they agree, namely, in forme and matter, but they differ in outward forme, which we may call fashion, as the one is round, the other halfe round, and the third direct, straight or falling a-slope. Also, they differ in place, about which they stand: for streames are only about the Sunne. Raynbowes about the Sunne often, and seldome about the Moon, but circles both about the Sunne and the Moone, and also about any other of all the Starres, yet rather, & oftner about bright Starres.

To make an end of these streames, they appeare diversly, after the fashion & place wherein the cloud hangeth, in respect of the Sunne: for sometime they are seene only in the edge of a cloud, all the breadth of that cloud: sometime thorow the mids of a cloud, being thinner there than in other parts, and then they are spred round about, like a tent or pavilion used in war. They are most commonly seen in such times, as there is great abundance of raine, which they, by their apparition, doe signifie not yet to be ended.

And thus much concerning direct light beames called roddes, &c.

Of many Sunnes.

Many Sunnes at once. Alexander the great. Darius.

IT is strange and marvellous to behold the likelyhood of that, which Alexander the great, sending word to Darius, said to be impossible, that two Sunnes should rule the World. But oftentimes, men have seen, as they thought in the firmament, not only two Sunnes, but oftner three Sunnes, and many more in number, though not so often appearing. These, how wonderfull soever they appeare, proceede of a naturall cause, which we will endeavour to expresse. They are nothing else but Idols or Images of the Sunne, represented in an equall, smooth, and watry cloud placed on the side of the Sunne, and sometimes on both sides, into which the Sunne beams being received, as in a glasse expresse the likenesse of fashion and light that is in the Sunne, appearing as though there were many Sunnes, whereas indeed there is but one, and all the rest are images.

This thick and watry cloud, is not said to be under the Sunne, for then it would make the Circles, called crownes or garlands: it is not opposite to the Sunne, for then would it make the Rainbow: but it is

sayd

sayd to be on the side, where the image may be best represented. Also it may not be too farre off, for then the beames will be too feeble to be reflected: neither yet too neere; for if it so be, the Sun will disperse it: but in a competent & middle distance: for so representation of many Sunnes is caused.

They are most often seene in the morning and evening, about the rising or going down of the Sunne, seldome at noone time, or about the midst of the day, because the heat will soon dissolve them: yet have there bene some seen, which began in the morning, & continued all the day long, unto the evening. Sometimes there appeare many little Suns, like unto little Starres, which are caused after the same sort, as we do see a mans face to be expressed in all the pieces of a broken glasse. So when the cloud hath many separations, there appears many Sunnes, on one side of the true Sun, sometimes great, & sometimes little, as the parts of the cloud separated, are in quantity. Many small Sunnes, like starres. Similitude.

They doe naturally betoken tempest and rayne to follow, because they cannot appeare, but in a watry disposition of the ayre. The signification of many Sunnes.

Also, if they appeare on the South-side of the Sunne, they signifie a greater tempest, than if they appeare on the North-side. The reason is alleadged, because the Southerne vapour is sooner resolved into water, than is the Northerne.

For a supernaturall signification, they have oftentimes bene noted, to have portended the contention of Princes for kingdomes: As not long before the contention of Galba, Otho, and Vitellius, for the Empire of Rome, there appeared three Sunnes. Also of late, toward the slaughter of Lewis King of Hungary, were seen three Sunnes, betokening three Princes that contended for the kingdome, namely Ferdinando since Emperour, Iohn Vayvode, and the great Turke.

Galba, Otho, and Vitellius.

Of many Moones.

AFter the treaty of many Sunnes, it were not hard for any man without farther instruction to know the naturall cause of many Moones: For they are likewise Images of the Moone, represented in an equall cloud, which is watry, smoth, and polished, even like a glasse. Some call them (as Plinius sayth) night Sunnes, because they, iorned with the ligh

Many Moones.

Plinius.

of

of the true Moone, give a great shining light, to drive away the shaddow and darknesse of the night.

It were superfluous, to write more of their causes, or effects, which are all one with those, that have bene declared of the Sunnes.

It may bee doubted, why the other Starres doe not likewise expresse their image, in watry clouds, and so the number of them, to our sight, should be multiplied. It may be answered, that their light or beames are too feeble and weake, to expresse any such similitude or likenesse in the watry clouds: For although they have garlands, or circles about them that are caused in a vapor, that is under them, yet it is manifest, that this apparition hath not need of so strong a light, as is required to print the images of them in the clouds. Againe, the garlands are direct under, and therefore apter to receive such apparition. Why other starres are not so represented.

It may be againe obiected, that the Starres have their image perfitly and sufficiently expressed in glasses here on the earth, yea, and at the day time, when their light is eyther none, or most feeble, and Objection

weake, as we see it is used at Midsummer, to behold that great Starre called Sirius, in a glasse even at noone dayes.

Sirius a great Starre seen at noone in Summer.

Also we see every night, the image of the Starres in calme and quiet standing waters: then, what should let, but that their images might also be expressed in watry cloudes?

An answer.

Hereto may be answered, that the let is in the cloud, which is neither so hard as is the glasse, nor yet so continuall as the water, but consisteth of innumerable small drops, so that except the light of the Starres were stronger, it can in them expresse no uniforme images of them, as it doth in glasses, and in the water. Notwithstanding, in writers of wonders, I was read some such like thing sometime to have chanced.

There hath beene often seene many Sunnes in the day time, and after the Sun setting: at the rising of the full Moone, there have appeared many Moones, which was by this meanes, that the same cloud, that received the Sunne beames in the morning, tarried in the same place, and at the Moones rising, was ready also to receive her image.

Of

Of wonderfull apparitions.

Wonderfull apparitions.

WE will close this booke, with a briefe declaration of the naturall causes of many things that are seen in the ayre, very wonderfull and strange to behold, which in these latter yeares have bin often seen and beheld, to the great admiration of all men, not without the singular providence of God, to forewarne us of many dangers that hang over us, in these most perillous times.

The apparitions of which, as it is most wonderfull, so the searching of the cause, to us is most hard and difficult, a great deale the rather, because no man hath hitherto enterprised (to my knowledge) to seeke out any cause of them, but all men have taken them as immediate miracles, without any naturall meane or cause to procure them.

And I truely doe acknowledge, that they are sent of God, as wonderfull signes, to declare his power, & move us to amendment of life, indeed miraculous, but not yet so, that they want a naturall cause: for if they be well weighed & considered, it is not hard to find, that they differ much from such miracles as are recorded in the Scripture,

ture, and admitted of diuines. So that as I abhorre the opinion of Epicures, to thinke that such things come by chance, but rather by the determined purpose of Gods prouidence: so I consent not with them, that suppose, when any thing is derived from any naturall cause, God the chiefe and best cause of all things is excluded.

Some of these wonderfull apparitions consist of circles and Rainbowes, of diuers fashions and placings, as one within another, the edge of one touching another, one diuiding or going thorow another, with like placing of small circles about great circles or parts of small circles; some with the ends vpward, some downward, some aside, and some a crosse, but all for the most part in vniforme order constituted or placed for the order of them, pleasant to behold, but for the strangenesse, somewhat fearefull. Such a like apparition is made with the Sunnes or Moones images, ioyned vnto these circles, set also in good and vniforme order.

The cause of these is the meeting together of all those seuerall causes that make the circles, Rainbowes, streames, and images,

ges of the Sunne or Moone, which joyned all together, make the wonderfull sight of strange Raynbowes, positions of circles, crosses, and divers lights, which pertaine to the knowledge of Optice and Catroptice, that teach how by divers refractions & reflections of beames, such visions are caused. So that he which will know how they are generated, must returne into the severall treatises of Raynbowes, circles, streames, and images of the Sun or Moone: and if in them he find not knowledge sufficient to instruct him, I must send him to the demonstrations of perspective, where he shall want nothing. Optice. Catoptice.

Another sort of them, no lesse often beheld within these few yeeres than the former, but a great deale more strange and wonderfull to looke upon, are the sights of armies fighting in the Ayre, of Castles, Cities, and Townes, with whole Countries, having in them Hills, Vallies, Rivers, Woods, also Beasts, men, and Fowles, Monsters of which there are no such kindes on the earth, and finally, all manner of things andactions that are on the earth, as burials, processions, judgements, combates, men, women, children,

children, horses, crownes, armes of certaine noble men, and countries, weapons of all sortes, some times starres, Angels as they are painted with the image of Christ crucified, besieging of castles and townes, many things and gestures done by men or beasts, the very similitude of persons knowne to the beholders, as of late, was seene the very Image of the Emperour Charles, in so much that they which beheld it, put off their cappes, thinking verily it had beene he, and of Iohn Frederick, Prince Elector of Saxony, who that time was prisoner with the Emperour. Also the image of small crosses, which hath beene not only in the ayre, but also on the earth, on mens apparell, on dishes, platters, pots, and all other things, so that the Iewes have been full angry, that they could neither wash, nor rub them out of their apparell. In Germany also fires and many such things, as it were long stories seen in the ayre.

All these wonderfull apparitions may be caused two manner of wayes: the one artificially, the other naturally. Artificially, by certaine glasses, and instruments made according to a secret part of that know-

knowledge, which is called Catoptrice, and so perdaventure some of them have bene caused, but the most part (doubtlesse) naturally, when the disposition of the ayre hath bene such, that it hath receyved the image of many things placed and done on the earth. And because it is apt to receyve divers images, as well in one place as in another, these monstrous formes and strange actions, or stories, proceed, of the ioyning of divers formes and actions, as if two Historyes were confusedly paynted in one, the whole picture would bee strange: or (as the Poet saith) if a Paynter, to a mans head, should set a horses neck, and after, divers feathers. Sometimes also, one image is multiplied in the ayre, into many or infinite, as are letters and crosses, which fill all the ayre, even beneath: And the light of the Sun, receyved into little parts maketh to appeare, as it were many small Starres. Catoptrice. Horatius.

Let this suffice, concerning these wonderfull apparitions: once againe admonishing the Reader, though I have enterprised to declare these by naturall reason, yet verily believing, that not so much as one Sparrow falleth to the ground,

ground, without Gods prouidence, I doe also acknowledge Gods prouidence bringeth these to passe, to such end as before I haue shewed, using these causes, as meanes and instruments to doe them.

The fourth Booke, of watry impressions.

THose be watry impressions, that consist most of water. In the treaty of them, are wont to be handled these impressions, namely clowdes, rayne, dew, hoare frost, hayle, snow, springs, riuers, and the great Sea it selfe.

Of Clouds.

uds. A Cloud is a vapor cold and moyst, drawne out of the earth, or waters, by the heate of the Sunne, into the middle region of the ayre, where, by cold it is so knit together that it hangeth, untill either the waight, or some resolution, cause it to fall downe.

The place wherein the clowdes doe hang, is sayd to be in the middle region of the ayre, because men see it is necessarie that there should be a cold, which should

should make those vapors so grosse and thick, which for the most part are drawn so thinne from the earth, that they are invisible, as the ayre is. And although they are knowne oftentimes, as Aristotle witnesseth, to be in the lowest region of the ayre, neere to the earth, in so much that sometimes they fall downe to the earth with great noyse, to the great feare of men, and no lesse losse and danger; yet may it be reasonably thought, that these clouds were generated in the middle region of the aire, farre distant from the earth, which by their heavinesse doe by little and little sinke downe lower into the lowest region, and sometimes also fall downe to the earth. Aristotle.

The common opinion is, that they goe not higher than nine myle, which, because it leaneth to no reason, is uncertayne. The height of the clouds.

Albertus Magnus, whose reason also is to be doubted of, affirmeth, that the clouds doe scarce exceed three miles in height, when they are highest. Albertus Magnus.

And some let not to say, that oftentimes they ascend not past the halfe of one mile in height.

Againe,

Againe, other pretending to finde out the truth, by Geometricall demonstrations make it above fifty mile to the place where the generation of clouds is.

How these men take the distance from the earth, it is uncertaine: whether that they assigne the least distance, and meane it from the highest part of the earth, as are hill tops, or from the common playne.

Againe, whether they that assigne the highest distance to be from the lowest valleys of the earth, or from the hill tops.

The reason before shewed, moveth me to thinke that the most usuall and common generation, I meane, the condensation or making thick of these thinne vapors, into clouds, is in the middle region of the ayre. But for the distance of the clouds, when they be generated, I thinke, they be sometime nine mile, sometime three mile, sometime halfe a mile, and sometime lesse than a quarter of a mile from the earth.

Mists.

Of Mists.

There be two kindes of Mists; the one ascending, the other descending. That which ascendeth, goeth up out of the water, or the earth, as smoke, but doth not

not commonly, spread over all other parts: it is seen in rivers and moyst places.

The other mist that goeth down toward the earth, is when any vapor is lifted up into the ayre, by the heat of the Sun, which not being strong enough to draw it so high, that the cold may knit it, suffereth it, after it is a little made thick, to fall down againe; so it filleth all the ayre with the grosse vapours, and is called, Mists, being usually a signe of faire weather.

Of empty cloudes.

Empty clouds.

There be certaine clouds that are empty, and send no rayne; they come of two sorts. One sort are the remnants of a cloud that hath rained, which cannot be converted into water, for their dryneſſe.

Another sort is of them that are drawne up out of wet and dry places, and be rather Exhalations than vapors: that is, they be dry, hote, and light, so that it were hard for them to be turned into rayne: they loke white, like flocks of wull, when the light striketh into them.

There be also empty clouds, which, when the winds have dispersed abroad any cloud, are scattered over all the skie: but these clouds, though for a time they be empty, yet

because

becauſe they conſiſt of ſuch a ſubſtance as is watry, they may be, and are oftentimes gathered together, and giue plentifull rayne.

Of the colours of clouds.

Of the colours of cloudes, we haue ſpoken in the ſecond booke of fiery Meteors, where thoſe colours and the cauſes of them are deſcribed, which ſeeme to be fiery, or may be thought to be inflammations or burnings, as to be redde, fiery and yellowiſh.

But beſides thoſe, there be white, black, blue, and greene.

White clouds be thinne, and not very watry, ſo that the light receiued in them, maketh them to appeare white.

Black clouds be full of thick, groſſe, and earthly matter, that maketh them looke ſo darke.

Blue clouds be full of thick groſſe, and earthly, as the black: ſo the light receiued in them, maketh them to ſeeme blue.

Greene clouds are altogether watry reſolued into water, which receiuing into them the light, appeare greene, as water doth in a great veſſell, or in the Sea and Riuers.

Of

Of Rayne.

AFter the generation of clouds is well knowne, it shall not be hard to learne, from whence the Raine commeth. Raine.

For after the matter of the cloud being drawne up, and by cold made thick (as is said before) heate following, which is most commonly of the Southerne winde, or any other wind of hot temper, doeth resolve it againe into water, and so it falleth in drops, to give increase of fruit to the earth, and move men to give thankes to God.

There be small showres, of small drops, and there be great stormes, of great drops.

The showres with small drops, proceed eyther of the small heate that resolveth the clouds: or else of the great distance of the clouds from the earth.

The streames with great drops contrariwise doe come of great heate, resolving or melting the cloud, or else of small distance from the earth. Whereof we see a plaine experiment, when water is powred forth from an high place, the droppes are small, but if it be not from height, it will either have no droppes, or very great.

The cause why raine falleth in round drops, is both for that the parts desire the same forme that the whole hath, which is round; and also, that so it is best preserved against all contrary qualities: like as we see water powred upon dry or greasy things to gather it selfe into roundels, to avoid the contrariety of heate and drynesse.

Why raine water is not salt.

It is not to be omitted, that raine water, although a great part of it be drawne out of the sea, yet most commonly it is sweet and not salt.

The cause is, because it is drawne up in such small vapors, and that salt part is consumed by the heat of the Sunne.

The raine water doubtlesse doth more encrease and cherish things growing on the earth, than any other water wherewith they may be watered, because the raine water retaineth much of the Sunnes heat in it, that is no small comfort to all growing plants. The water that commeth from Heaven, in raine, will sooner come to putrefaction, or stinking, than any other, because it hath beene made very subtill by heate, and also for that it is mixed with so many earthly and corruptible substances.

Rayns

Rayne water, that falleth in the summer, by Avicens iudgement, is more wholesome than other water, because it is not so cold and moyst as other waters be, but hotter and lighter. Avicen.

Sometime there is salt rayne, when some Exhalation which is hot and dry, is commixed with the vapour whereof the rayne consisteth. Salt rayne.

Sometime it is bitter, when some burnt earthly moysture is mixed with it. Bitter rayne.

This rayne is both unwholesome, and also unfruitfull. In these countreys, there is great store and plenty of rayne, because the Sunne is of such temperate heate, that it gathereth many vapours, and by immoderate heate doeth not consume them. But in the East parts, in some hot Countreys, it never or seldome is seene to rayne, as in Egypt and Syria, but in stead of rayne, Egypt hath the River Nilus, whose overflowings doe marveylously fatten the earth. In Syria and other like Countreys, they have more plentifull dew, than we have, which doth likewise make their earth exceeding fruitfull. The river Nilus.

Seneca testifieth, that the rayne soketh no deeper into the earth, than ten foote deepe. Seneca.

Of the signes of rayne.

Signes of rayne.

First, if the skie be red in the morning, it is a token of rayne, because those vapors which cause the redneſſe, will be shortly resolved into rayne.

If a darke cloud be at the sunne rising, in which the Sunne seene after is hidde, it will dissolve it, and rayne will follow. If then appeare a cloud, and after, vapours are seene to ascend up to it, that betokeneth rayne.

If the Sunne or Moone loke pale, loke for rayne.

If the Sunne in the East seeme greater than commonly he appeareth, it is a signe of many vapours which will bring rayne.

If the Sunne be seene very earely, or few Starres appeare in the night, it betokeneth rayne.

The often changing of the winds, also sheweth tempest.

The most sure and certayne signe of raine, is the Southern wind, which with his warmeneſſe, alwayes resolveth the clouds into rayne.

When there is no dew at such times as by nature of the time there should be

rain

rayne followeth: for the matter of the dew is turned into the matter of watry Clouds.

If in the West, about the Sunne setting, there appeare a black cloud, it will rayne that night, because that cloud shall want heate, to disperse it.

When much dust is raysed up, & when the woods make a great noyse, some tempest is towards.

Hard stones will be moyst, and sweate against rayne: lamps & candles by sparkling, frogs crying, trées breaking, leaves falling, and dust clottering, forewarne us of a tempest.

Fleas, flyes & gnats, bite sore toward a tempest, Kine fæde grædily, birds seeke their vitailes more busily: for in the grosse aye disposed to rayne, their stomacks are hotter, and they more hungry. But these kind of signes pertayne not so properly to Meteorologie, as to Mariners and husbandry, which have a great many more than these. And Virgill in his first booke of Georgikes, hath a great number, for them that list to learne. Wherefore let these hitherto suffice.

Of monstrous or prodigious rayne.

Of Monstrous rayne.

HItherto we have made mention only of naturall rayne, & that which is common, which no man doth marvell at. But there is some time such rayne, that worthily may be wondred at: as when it rayneth wormes, frogges, fishes, blood, milke, flesh, stones, wheat, iron, wooll, brick, and quicksilver. For histories make mention, that at divers times, it hath rayned such things, whose naturall cause, for the most part, we will goe about to expresse, notwithstanding, accounting them among such wonders, as God sendeth to be considered for such ends, as we have before declared, Wormes and Frogges may thus be generated: when fat Exhalations are drawn up into the ayre, by a temperature of hote and moyst, such vermine may be generated in the ayre, as they are on the earth, without copulation of male and female. Or else, that with the Exhalations and vapors, their seed and egges are drawn up, which being in the clouds brought to forme, fall down among the rayne.

Wormes & Frogges.

Fishes.

Likewise the spawne of fishes, being drawne up, maketh fishes to rayne out of the clouds.

Milke.

The vehement heate of the Sunne,

Sunne, in Summer, and specially in hote Countries, draweth milke out of the paps of beasts and cattell, which being carryed up in vapours, and resolved againe into milke falleth downe like rayne.

After the same manner, the Sunne also from places where bloud hath beene spilt, draweth up great quantity of blood, and so it raineth blood. Blood.

It rayneth flesh, when great quantity of blood being drawn up, it is clottered together, and seemeth to be flesh. Flesh.

Avicen sayth, that a whole calfe fell out of the ayre: and some would make it seeme credible, that of vapours and Exhalations, with the power of heavenly bodies concurring, a calfe might be made in the clouds. But I had rather thinke that this calfe was taken up in some storme of whirlewind, and so let fall againe, than agree to so monstrous a generation. Avicen.

It is a great deale more reasonable, that Stones of earthly matter gathered in clouds, should be generated as we have said before of the thunderbolt. Yet some men thinke, that wind in caves of the earth breaking upward violently, carrieth before it, earthy stones into ỳ ayre, which cannot Stones.

long abide, but fall downe, and are counted among prodigious raine. Exhalations

Brick. that be earthy and drawn out of clay, have much grosse substance in them, which gathered together, and by great heat burned in the clouds, make brick, which is no great marvell.

Wheat. He that hath seene an egges shell full of dew drawn up by the Sunne into the ayre, in a May morning, will not thinke it incredible, that wheat and other graine should be drawne up in much hotter countries than ours is, much rather the meale or flowre which is lighter.

Wooll. A certaine mossinesse, like wooll, as is upon Quinces, willowes, and other young fruits and trees, is drawne up of the Sunne among the vapours and Exhalations, which being clottered together, falleth downe like locks of wooll.

Quicksilver. Quicksilver, all men know with small heate will be resolved into most thin vapours, whereof when quantity is drawn up, it falleth downe againe: As it is read, that once at Rome it rayned Quicksilver, wherewith the brasen money being rubbed it loked like silver.

Titus Livius maketh mention, that it rayned

rayned chalke, whereof the cause cannot be hid to them, that read how stone and brick come in the ayre. Chalke. T. Livius.

Iron hath also rained out of the clouds, and sundry times, as histories witnesse, whereof this hath bin the cause: The generall matter of all mettalles, which is quicksilver and brimstone, with the spetiall matter of mirtion, that maketh Iron, were all drawne up together, and there concocted into the mettal: so came the strange raine of Iron. Iron.

Avicen saith, he saw a peece of Iron that fell out of the cloudes, that waighed about an hundred pound waight, whereof very good swords were afterwards made. Avicen.

Of Dew.

DEwe is that vapour, which in Spring and Autumne, is drawne up by the Sunne in the day time, which, because it is not carried into the middle region of the ayre, abiding in the lower region, by cold of the night, is condensed into water, and falleth downe in very small droppes. Dew.

There is common dew, and sweet dew.

One

One kinde of the sweet dewes is called Manna, being white like Sugar, which is made of thick and clammy vapors, which maketh it so to fall thick and white. It falleth only in the East parts. As for that Manna, which God rayned to the Israelites, it was altogether miraculous.

Manna.

Plinius.

In Arabia (as Plinius writeth) is a very precious kinde of dew, that is called Ladanum, which falling upon the herbe Cusus, & mixed with the iuice of that herbe which Goates doe eate, is gathered of Goates haires, and kept for a treasure.

Arabia.

Ladanum.

Cusus.

There is another kind of swéet dewes, that falleth in England, called the Meldewes, which is as sweet as honey, being of such substance as honey is: it is drawne out of sweet herbes and flowers.

There is also a bitter kind of dew, that falleth upon herbs, and lyeth on them like branne or meale, namely, because it is of an earthy Exhalation, and so remaineth, when the moysture is drawne away: this dew killeth herbes.

Bitter dew

The common dew drunke of cattell, doth rotte them, because the matter is full of viscosity, bringing them to a flurion.

There be three things that hinder dew from

from falling, that is, great heate, great cold, and wind: for dew falleth in the most temperate calme time.

Of hoare Frost.

HOare frost, or white frost is nothing else, but dew congealed by ouer much cold. The South and East wind doe cause dew, but the North and Northern winds doe frieze the vapours; and so it becommeth hoare frost: which, if that excessiue cold had not bin, should haue turned into dew. Hoare frost.

The dew and the hoare frost agrée in three things, namely, in matter, in quality of time, and place of their generation. In matter they agrée; for they are both generated of a subtill and thinne vapour, and also small in quantity.

In quality of time they consent; for both are made in a quiet and calme time: for if there were great wind, it would driue away the matter, and so could there be no generation

Thirdly, they are both generated in the lowest region of the ayre, for (as Aristotle affirmeth) upon high hilles, there is neyther dew nor hoare frost. Aristotle.

They differ also in three things. For the

the hoare frost is congealed, before it be turned into water; so is not the dew.

Secondly, the dew is generated in temperate weather, the white frost in cold weather.

Last of all, hote windes, as the South and East, doe cause dew, but cold winds, as the North and West, doe cause hoare frost.

Hoare frost doth often stinke, because of the stinking matter whereof it consisteth, which is drawne out of lakes and other muddy and stinking places.

Of Hayle.

Hayle. Hayle is a hote vapour in the middle region of the ayre, by the cold of that region, made thick into a cloud, which falling downe to the sudden cold of the lowest region, is congealed into Ice.

There be so many kindes of hayle, as there be of rayne. The fashion of hayle is sometime round, which is a token, that it was generated in the middle region of the ayre, or very neere it: for falling from high, the corners are worne away.

When the hayle-stones are square, or three-cornerd, the hayle was generated neere the earth.

Often-

Oftentimes there is heard a great sound in the Clouds, as it were of thunder, before hayle, or of an army fighting, &c. The cause is, that vapours of contrary qualities, being inclosed in the Cloud, doe strive to breake out, and make a noyse, even as cold water doeth, being put into a seething pot.

In spring and harvest time is often haile, seldome in Summer and Winter. In winter there want hote vapours; in Summer, the lowest region is too hote, to congeale the rayne falling downe. In spring and Autumne, there want neyther hote vapours, to resist the cold, nor sufficient cold to harden the drops of that hote showre of rayne.

The hayle stones are sometimes greater, and sometimes lesser; greater, with greater cold and lesser, with lesser cold.

There is seldome hayle in the night, for want of hote vapours to be drawn up.

Sometime hayle and rayne fall together, when the latter end of the Cloud, for want of cold in the lowest region, is not congealed.

Hayle-stones are not so cleare, as Ice, because they are made of grosse and earthy vapours,

vapours, Ice is congealed of cleare water.

Hayle is sooner resolved into water, than Snow, because it is of a more sudden and swift generation.

Of Snow.

Snow.

Snow is a cloud congealed by great cold, before it be perfectly resolved from vapours into water.

Snow is white, not of the proper colour, but by receiving the light into it, in so many small parts; as in foame, or the white of an egge beaten.

Snow is often upon high hilles, and lyeth long there, because their tops are cold, as they be neere to the middle region of the ayre: for oftentimes it rayneth in the valley, when it snoweth on the Hilles.

Originall of Christall.

Snow melting on the high hilles, and after frozen againe, becommeth so hard, that it is a stone, and is called Christall.

Other matters of Snow, because they are common with Rayne, are needlesse to be spoken of. To be short, Hayle is generated even as Snow, but of lesse cold, or else beginneth to melt in the falling.

Snow causeth things growing to bee fruitfull, and encrease, because the cold

dryveth

driveth heate unto the rootes, and so cherisheth the plants.

Of Springs and Rivers.

The generation of springs is in the bowels of the earth, therefore something must be said of the body of the earth. The earth, though it be solid and massie, yet hath it many hollow gutters & veines, in which is alwayes ayre to avoyd emptynesse: for the ignorant in Philosophy must be admonished, that all things are full, nothing is empty, for nature abhorreth emptinesse, so that where nothing else is, there is ayre and vapours, which by cold, as it hath often been said, will be resolved into drops, as we see experience in marble pillers & such like hard stones, toward raine. This ayre & vapours therefore, being turned into drops of water, these drops sweat out of the earth, and finde some issue at the length, where many being gathered together, make great abundance of water, which is called a fountaine or spring. The cause why such springs doe run continually, is because that ayre can never want in these veines, which by cold will alwaies be turned

Springs.

Nothing is empty.

turned into water, so that as fast as the water runneth forth, so fast is ayre againe received into the place, whereby it commeth to passe, that so many springs are perpetuall, and never dryed: but if any be dried up, it is in a hot Summer, and such springs also they be, whose generation is not deepe in the earth, and therefore the vapors may be made dry, and the earth warme, so the spring may faile.

There be foure kinds of springs, fountaines, brookes, rivers, and lakes.

Of Fountaines.

Fountaines. FOuntaines bee small springs, which serve for wels and conduits, when there is but one place, where the water is generated, and that is not very abundant, eyther because it is of small compasse, or small veines, and not many.

Of Brookes.

Brookes. BRookes, bournes or fordes, bee small streames of water, that run in a channell, like a river. They are caused when either the spring occupieth a great compasse, or else two or three small springs meet together in one channell.

Of Rivers.

Rivers. RIvers are caused by the meeting together,

gether, not only of many ſpꝛings, but alſo of many bꝛookes and foꝛds, which being receiued in diuers places as they paſſe, are at the length caꝛied into the bꝛoad Sea foꝛ the moſt part. Notwithſtanding ſome Riuers as ſwallowed up into the Earth, which perchance run into the Sea, by ſome ſecret and vnknowne channels: ſome Riuers there be, that hide their heads vnder the Earth, and in another place, faꝛ off, bꝛeake out againe. They wꝛite alſo, that ſome Riuers being ſwallowed up of the Earth, in one Iland doe run vnder the bottome of the earth and Sea, and bꝛeake foꝛth in another Iland. There be alſo many great Riuers, that run vnder the Earth in great Caues, which neuer bꝛeake foꝛth. Ariſtotle ſheweth of ponds and lakes, that be vnder the Earth. And Seneca ſpeaketh of a pond, that was found by ſuch as digged in the Earth, with fiſhes in it, and they that did eat of them, dyed. As Eeles that be found in darke places, as Wells that haue beene dammed vp, &c. are poyſon. Ariſtotle. Seneca.

Of Lakes. Lakes.

LAkes are made by the méting together of many Riuers, bꝛooks and ſpꝛings into one deepe valley: whereof, ſome are ſo great,

great, that they have the name of seas, as the great lake called Hircane, or Caspian Sea. These lakes sometimes unlade themselves into the Sea, by small rivers, sometimes by passages under the earth.

The cause of the swiftnesse of Rivers, is double: for they are swift, either for the great abundance of waters, or else because they run downe from an hilly place, as the River Rhene falleth down from the top of wonderfull high hills.

Of hot Bathes.

Hote Baths. Some waters, that are generated & flow out of veines of brimstone, are sensibly warme, and some very hot, because they run out of hot places. These waters being also drying by nature, are wholesome for many infirmities, specially breaking forth of scabs, &c. Such are the baths in the West country, and S. Anne of Buckstones well in the North part of England, and many other elsewhere.

Of the divers tastes that are perceived in welles.

Tastes of waters. For a generall reason, the waters receive their taste of that kind of earth, thorow which

which they runne, as thorow a strayner. Some salt, that run thorow salt veines of the earth: some sweet, that be well strayned, or run thorow such minerals as be of sweet taste: some bitter, that flow out of such earth, as is bitter by adustion or otherwise.

Some sowre or sharpe, like vineger, which run thorow veines of Allome, coperus, or such minerals. Aristotle writeth of a well in Sicilia, whose water the Inhabitants used for vineger. Aristotle. Well water used for Vineger.

In Bohemia neere to the city called Bilen, is a well that the people use to drink of in the morning, in stead of burnt wine. Bohemia.

And in divers places of Germany be springs, that taste of such sharpenesse.

Some have the taste of wine, as in Paphlagonia is a well, that maketh men drunke, which drink thereof: which is, because that water receiveth the fumosity of brimstone, and other minerals, thorow which it runneth, and so filleth the braine as wine doth. Paphlagonia.

A recitall of such rivers and springs, as have marvellous effects, whereof no naturall cause can bee assigned by most men, although some reason in a few may be found.

Marveylus waters Clitumnus Propert.

Clitumnus, which maketh Oxen that drink of it, white, is a River of Italy, Propert. lib. 3. This may be the quality of the water, very flegmatick. In Boetia is a river called Melas, that maketh sheep black, if they drinke thereof.

Boetia. Melas.

Seneca.

Seneca speaketh of a River that maketh red hayres. These two with the first, may have some reason, that the quality of the water may alter complexion, and so the colour of hayres may be changed, as we see in certaine diseases.

Libia.

In Libia is a spring, that at the Summe rising and setting, is warme; at mid day cold, and at mid night, very hote. This may be, by the same reason, that wel-water is colder in Summer, than it is in winter. Seneca writeth, that there be Rivers, whose waters are poyson: this may be naturally, the water running through mynes of poysonous minerals, taking much fume of them. Other Wels that make wood and all things else that be cast into them, stones, such welles be in England, the cause is great cold.

Seneca.

Another Well maketh men madde that drinke thereof. This also may have as good reason, as that which maketh men

drunke:

drunke: As also that Well, which maketh men forgetfull by obstruction of the brain.

The same Seneca speaketh of a Water, that being drunke, provoketh unto lust and lecsery. And why may not that quality be in a Water, which is mixed with divers minerals and kinds of earth, which is in herbes, rootes, fruits and liquours?

S. Augustine speaketh of a well in Egypt, in which burning torches are quenched, & being before quenched, are lighted. S. August.

Among the Garamants is a Well, so cold in the day, that no man can abide to drinke of it: in the night so hot, that none can abide to feele it. Garamants.

It is incredible, that is written of a well in Sicilia, whereof if theeves did drinke, they were made blind. Sicilia.

In Idumea was a Well, that one quarter of a yeere was troubled and muddy, the next quarter bloody, the third greene, and the fourth, cleare. Idumea.

Seneca writeth of another Well, that was fire houres full and running over, and fire houres decreasing and empty: perchaunce, because it ebbed and flowed with the Sea, or some great River that was nere it. Seneca.

Anthracius. In the hill Anthracius, is sayd to be a well, which when it is full, signifieth a fruitfull yeere, when it is scarce and empty, a barren and deare yeere. The sufficiency of moysture maketh fertility, as the want causeth the contrary.

Hungaria. Men say, there is a river in Hungary, in which Iron is turned into Copper: which may well be, seeing inke, in which is but small coperus, and artificially mixed, of Iron, doth counterfeit copper in colour. In this streame may be much coperus, and that is naturally mixed.

Seneca. Theophrastus. Both Seneca and Theophrastus witnesse, that waters there be, which within a certaine space, being drunke of sheepe, (as Seneca sayth) or of birds (as Theophrastus will have it) changeth their colours from black to white, and from white to black.

Vitruvius. Arcadia. Nonacrinis. Vitruvius writeth, that in Arcadia is a water called Nonacrinis, which no vessell of Silver, Brasse, or Iron, can hold, but it breaketh in peeces, and nothing, but a Mules howfe, will hold it and containe it.

Illyria. In Illyria, garments that are holden over a most cold Well, are kindled and set

set on fire.

In the Ile of Andros, where the Temple of Bacchus stod, is a Well, that the first day of January flowed wine. Andros. Bacchus.

Isidore saith, there is a Well in Italy that healeth the wounds of the eyes. Isidorus.

In the Ile of Chios is a Well, that maketh men dull-witted, that drinke thereof. Chios.

There is another, that causeth men to abhorre lust.

Lechnus, a Spring of Arcadia, is good against aboritions. Lechnus.

In Sicilia are two Springs, of which one maketh a woman fruitfull, and the other barren. Sicilia.

In Sardinia be hote Welles, that heale sore eyes. Sardinia.

In an Ile of Pontus, the River Astares overfloweth the fields, in which what soever sheepe be fedde, doe alwayes give black milke. Pontus, Astares.

In Aethiopia is a Lake, whose water is like oyle. Aethiopia.

Also, many Springs of oyle have broken forth of the earth, which commeth of the viscosity or fatnesse of the same earth.

The Lake Clitory, in Italy, maketh men that drinke of it, to abhorre wine. Clitorius.

Pentasium Solinus. The lake Pentasium (as Solinus sayth) is deadly to Serpents, & wholsom to Men.

Seneca writeth of certaine Lakes that will beare men, which cannot swimme.

Syria. And that in Syria is a lake, in which bricks doe swimme, and no heavy thing will sinke.

Rhenus. It is said, that the River Rhene in Germany will drown bastard children that be cast in it, but drive alande them that be lawfully begotten.

Hypanis. Sythia. The River Hypanis in Sythia, every day brings forth little bladders, out of which flies doe come that dye that same night.

Matrona. Matrona the River of Germany, as the common people saith, never passeth day, but he taketh some pray.

Of the Sea.

The Sea. The Sea, in this treatise hath place as a mired substance: for else the element of waters being simple, were not here to be spoken of.

The naturall place of the water. The Sea is the naturall place of the waters, into which, all Rivers and other waters are received at the length.

And here it is to be understood, that the very proper and naturall place of the water,

ter were to cover all the earth, for so be the elements placed: the earth lowest, and round about the earth the water, about the water, the ayre, and about the ayre, the fire. But God the most mighty and wise creator of all things, that the earth might in some parts be inhabited of men and beasts commanded the waters to be gathered into one place, that the dry land might appeare, and called the dry land, earth, and the gathering of waters, he called Seas. Gen. 1.

In the Sea, are these two things to bee considered, the saltnesse, and the ebbing and flowing.

Of the saltnesse of the Sea.

The saltnesse of the Sea, according to Aristotles mind, is caused by the Sun, that draweth from it, all thin and swæt vapours, to make raine, leaving the rest, as the setling or bottome, which is salt. But men of our time, peradventure more truely, doe not take this for the only and sufficient cause, to make so great a quantity of water salt, but say, that the Sea, by Gods wisdome is gathered into such valleyes of the earth, as were otherwise barren and unfruitfull; such earths Aristotle.

are

are salt, the sea water then mixed with that earth, must needs be Salt, else Rivers by Aristotles mind, should be salt, as well as the Sea. The Reader may chuse which opinion is most probable.

Of the ebbing and flowing.

Ebbing & flowing. Aristotle.

The ebbing and flowing of the Sea, as Aristotle seemeth to teach, is by reason of Exhalations that bee under the water, which drive it to and fro, according to contrary bounds and limits, as upward and downeward, wide and narrow, deepe and shallow. This opinion of Aristotle also, is more subtill than true: experience teacheth men to mislike, and to ascribe the cause of ebbing & flowing, to the course of the Moone, which ruleth over moysture as the Sunne doth over heat: for from the new Moone, to the full, all humors do encrease and from the full to the new Moone, decrease againe. Also, the very true time of the ebbing and flowing, may be known by the course of the Moone, with whom, as the Lady of moysture, we will close up the fourth booke of moyst and watry impressions.

The

The fift Booke, of earthly Meteors, or bodies perfitly mixed.

THis last Treatise contayneth such bodyes, whose chiefe matter is the earth, and are called perfitly mixed, because they are not easily resolved into the chiefe matter whereof they are generated. These are divided into foure kindes. The first be divers sorts of earth: the second be liquors concreat: the third be metals and metallikes: the fourth be stones. This division is not altogether perfect, both for that there bee many of these minerals, which partake of two kinds, and also for that the names of some of these kinds may be said of other. Yet minding as playnly as can be, to declare the things themselves, the controversy and cavillation of names, shall not greatly trouble us, especially séeing we pretend not to teach Philosophers, but such as néed a ruder & plainer instruction. They may therefore be content with this division, which shall not serve them to dispute of these matters, but to understand ẏ truth

Earthly bodies.

truth of these things that they desire. Of these foure therefore, we will speake orderly and generally, not minding to intreat of every particular kinde (for that were infinite) but to open such universall causes, as they which have wit, may learne, (if they list) to apply unto all particulars.

Of Earths.

Of Earths. The earth is an element, one of the foure, cold and dry, most grosse and solide, most heavy and waighty, the lowest of all other in place. When I say an element, I meane a simple body uncompounded. This earth is no Meteor, but as it was shewed in the water, to the end there should be generation of things. There is no element that wee can have, which is pure and simple, but all are mixed and compound. Our fire is grosse and compound; so is our ayre, our water, and our earth: but the earth, notably and above the rest, is mixed. For the pure and naturall earth is dry and cold: but we see much to be moyst, and much to be hote. The naturall earth is black of colour: but wee see many earths white, many yellow, and many redde. So that first, the greatest part

part of the earth is mixed with water, that maketh it to cleave together, with ayre and some fire, which make an oyly, fat, or clammy earth, as is clay made, &c.

Another great part is dryed, not into the naturall dryneſſe of the firſt quality, but as a thing once mixed, and after dryed, either by too cold, as ſand, gravell, &c. or elſe by heat, as chalk, oker, &c. And yet somewhat more plainly and particularly to diſcourſe upon theſe cauſes, admitting the naturall colour of the earth to be black, of the water to be blue, of the ayre to be white, and of the fire to be ruddy, it followeth, that upon the mixtion of theſe colours, or chiefe domination of them, all things have their colour.

The groſſe ſubſtance of the earth therefore, being diverſly mixed with other elements, and thoſe mixtures againe being ſundry wayes altered, by divers, & ſometime contrary qualities, hath brought forth ſo many kinds of earth, as clay, marle, chalke, ſand, gravell, &c. Clay is mixed with fat moyſture, taking his colour of the mixture with red from white, but being cold, it is not ſo fruitfull as marle, which is not alwaies ſo moyſt as it. Chalke is an

earth

earth by heate concocted, after divers mixtions, and dried up. Oker, both yellow and red, with such like, are of the same nature, with mixtion of red, more or lesse.

Sand and gravell, are dryed earths, as it were frozen by cold: gravell is grosse and apparent; sand, though it be finer, is of the same generation, consisting of many small bodies, which are congealed into stones. Sand seemeth to be clay, dryed by cold, and coacted together into small stones, whereof some are thorow-shining, which were the moist parts; the thick were of the grosse part: the same is gravell, but of greater stones consisting. The like judgement is to bee given of all other kinds of earth, whose generation, by the similitude of these, will not be very hard to finde out. They that list to know the divers kindes of earths, must have recourse to Plinius, Cardane, and other writers, that recite a great number of them: but these are the chiefe and most common kindes.

Plinius. Cardanus.

Of liquors concreate.

WE take not liquors concreat so large-ly as the word doth signifie: for then should we comprehend both the other kinds follow-

following. But only those liquors, called in Latine, Succi, which are, as it were middle betweene metals and stones, of which, some being fat and oyly, doe burne as Brimstone, Sea-coales, Jeat, bitumen, &c. and the kinds of all these. Others doe not burne, as Salt, Alum, Coperus, Saltpeter, &c. and the kinds of these.

Of the first sort, which are generated of earthy and ayry vapours, fumes and Exhalations, the chiefe and most notable, is Brimstone, which seemeth to be the matter of all dry and hot qualities, that are in earthly Meteors. The rest are generated of such like vapours as Brimstone is, but then they be diversly mixed: as the coles have much earth mixed with Brimstone: Jeat seemeth to be all one but better concocted than coles. Of Amber is great contention, whether it be a minerall, or the sperme of a Whale: for it is found in the Sea, cast upon the shore. Now the Whales seed being of the very same qualities is taken more & lesse concreate of divers hardnes; some almost as hard as Amber: some softer, and some liquid: yet Cardan plainly defineth, that Amber is a mineral. Whether he have reason or experience, contrary to the vulgar opinion, Cardanus.

opinion, let them consider that list to contend. These minerals that will resolve with fire, it is apparant, that they were concreate with cold: in that they burnt, it is manifest, they have a fat and clammy substance mixed with them, as the other kinde hath not, which will not resolve so well with fire, as with water; which be salt, coperus, saltpæters, &c. These burne not, being watry, earthy, and not fat, unctuous nor clammy.

These be of divers colours, black, as Coles, and Jeat, because there is much earthy substance mixed with their sulphurous matter. Some be shære, as Salt, and Allome, having a substance watry, dryed, and concreate. Coperus is græne because it hath much cold matter that is blue, mixed with it. Salt, the most common and necessary of all these liquors concreat, that be moist and not fatty, hath two manner of generations, one naturall, and the other artificiall. The naturall generation, is, when it is first generated in the earth, after commeth the water of the Sea, and is infected with it; out of which the Salt is againe artificially gathered. Of these liquors concreat, bee

those

those strange wels and spryngs infected of which was spoken in the latter end of the fourth boke. Most notably brymstone causeth the hote bathes, and burneth in Aetna of Scicilia, and Vesuvius of Italy, casting up the Pumise stones, of which is no place here to entreat. Aetna and vesuvius.

Of Metals.

METals be substances perfitly mixed that will melt with heate and be brought into all manner of fashions that a man will. Of these the Alcumists say, there be seven kinds, to answer to the seven Planets: Gold, Silver, Copper, Tynne, Lead, Iron, and Quicksilver that they call Mercury. But saving their authorities Quicksilver is no more a metall, than Brymstone, which is as necessary to the generation of metall, as quicksilver is. For they all agree, that all metalles are generated of Sulphur, that is, Brymstone: which because it is hote, they call, The father; and Mercury, that is, quicksilver, which because it is moyst, they call, The mother. So by as good reason, may they call Brymstone a metall, as Mercury. Then there remayneth Metals. Mercury.

neth but fiue perfit metals, Gold, Siluer, Copper, Tynne, Lead, and Iron.

Of Gold.

Gold,

That most vnprofitable and hurtfull of all metals, Gold which most men dispraise, and yet all men would haue, is of all other metals the rarest, it is onely perfit, all other be corruptible. Gold neuer corrupteth by rust, because it is pure from poysonous infection, and most solide, that it receiueth not the ayre into it, which causeth all things to corrupt. It is perfitly concocted with sufficient heat, and mixture of Sulphur: all other metals, either are not so well concocted, or else they haue not the due quantity of brimstone. This opinion hath also place among the Alcumists, that because nature in all her workes seeketh the best end, she endeuoreth of all metals to make Gold: but being let, either for want of good mixture, or good concoction, she bringeth forth other metals, indeed not so precious, but much more profitable: and the lesse precious, the more profitable: for there is more use to the necessity of mans life, in Iron and Lead, than is in gold and siluer. But either the beauty, or the perfection, or

Why Gold rusteth not.

The opinion of the Alcumists.

at leaſt wiſe the rareneſſe of gold and ſilver haue obtained the eſtimation of all men, ſo that for them is ſold all manner of things holy and prophane, bodily and ſpirituall. What paines doe not men take to winne gold? euery man hath one way or other to hunt after it: But the Alcumiſt deſpiſing all other wayes, as ſlow, vnnaturall, and vnprofitable, laboureth, either to helpe nature in her worke, as of vnperfit metals to make perfit, or elſe to force nature to his purpoſe, by his quinteſſences and elixors, ſo that what by purging, what by concocting; what by mixing of Sulphur & quickſilver & much other like ſtuffe, at length he turneth the wrong ſide of his gowne outward all the teeth out of his head, and his body from health to a palſey, and then he is a Philoſopher, and ſo he will be called.

Of Silver.

Silver, the moſt pure metall next vnto gold hath indifferent good concoction in the earth, but it wanteth ſufficient heat in the mixture, that maketh it pale. It is found (as they ſay) running into diuers veines, as all other metals be, but this moſt ſpecially, after the ſhape and faſhion Silver.

of a tree, lying along with a body or stock, of proportion like to the body of a Tree, also with armes, branches, leaves and fruites. This metall, Silver, lacketh sufficient beate, and therefore commeth neither to the colour, solditie, nor perfection of Gold, and is generated in cold countries, neere unto the Norths and South poles, in so great quantity, that the husbandmen, when they plow their ground, turne up silver, among the clots in their daily labours, which they doe hide and conceale, lest the greedy Princes, for covetousnesse of the metall, should overturne and destroy their land.

The Gold mines are contrariwise most found in the hot countries of India and Aethiopia, because in them is sufficient of heat, for that unhappy generation.

This silver also, the Alcumists would faine make by Arte: but Mercurie the chiefe matter of the worke, is so subtill and so flye, that nothing can holde him, nothing can kill him: for if the glasse bee not very thick, hee will soon breake out of prison, and so there is nothing left.

Of Copper.

COpper, in colour, comming nærest to Gold, being not solid nor massie, (for of all metall, gold is the heaviest) giveth way to corruption, being infected with that greene minerall Copperus. Hereof be divers kindes, brasse, latine, and such like, which differ in digestion: the Copper being purest, is of best digestion, and nærest unto Gold; and so the rest in like degrees.

Copper is most like to silver in the waight, and in the hammering, wherefore the Alcumists have learned to make it white, that it deceiveth mens sight & handling: but the Goldsmiths doe easily try it, and by the taste of counterfeit silver, make copper again. Copper or brasse doth alway grow nære to the mine of Copperus, which running with it in the digestion, or naturall concoctiõ, hindereth it of perfection, maketh it to stink, and to be eaten of a græn rust. much adoe the Alcumists have to turne it into gold, if it might be, they dispute very reasonably and conclude almost necessarily in their talke, that it may be converted into gold, as a body that wanteth little of

perfection, which may be eaſily added unto it. But in concluſion of the worke, it is an harder matter to bring it to paſſe, than it was to purpoſe, before they had done it, to build an Abby at every miles end, upon Salisbury plaine, as one was minded.

Of Tinne.

Tinne. TInne, whereof great plenty groweth in the Weſt parts of England, in beauty and colour commeth nereſt to Silver, and of Silver wanteth nothing but ſolidity and hardnes: for Tinne is raw & undigeſted metall, alſo very porose & uncompact, which cauſeth it to craſh, when it is broken or bitten: ſo it fayleth of heate in the commixtion, and alſo ſufficient digeſtion in the earth: otherwiſe it is a faire and profitable metall, to ſerve the uſe of them unto whom Silver & gold are not ſo plentifull.

Of Lead.

Lead. LEad alſo, found in great abundance within this Realme, is a raw and undigeſted metall, as Tinne is, but yet of better digeſtion than commixtion: for it is mixed with agroſſe earthy ſubſtance, which maketh it to bee in colour ſo black and ſo ſubtle to corrupt: ſo that of the ſame fumes

and

and Exhalations, (which if they had been pure and well digested, if the place and matter would have suffered, should have been concreat into Silver) for lack of the same, Lead is generated, which comming plentifully, doth better service than Silver.

Of Iron.

Iron. IRon, the most necessary and profitable of all other metals, (and yet as ill used of many, as any other) is generated of such substance as Silver is, but mired with a red minerall, which eateth it with red rust, and also being of too extreame digestion, passing all other metals in hardnes. And as other metals, to the perfection of Silver, want sufficient concoction, whereby they come not to the same hardnesse: so Iron passeth and exceedeth Silver in immoderate digestion. But though it come not to the perfection of Silver, God forbid, that al Iron had bene turned into Silver; for then we should more have missed it, than Silver or gold, the want of which would hinder us nothing at all.

Of Quicksilver.

Quick-silver. THough Quicksilver be no mettall, yet because it is the mother of all metals, something is here to be spoken of it.

There be divers and sundry opinions, both of the generation, and also the qualities of it, which make the generation to bee hard to finde out. For if the quality were certainly agreed upon, there were an easier way found, to try out the generation. Some affirme, that it is exceeding hote, and that they would prove by the swift pearcing thereof into other things that bee porose.

Other say, it is exceeding cold, and that they prove by the exceeding waight of it, As for the pearcing, they say, it is caused of the exceeding mopstnesse, of which qualitty both parts doe graunt that it is. Concerning the generation, some have said, that it is pure and elementall water: some againe have thought, that it droppeth out of Heaven, and is a part of the Heavenly substance. And other said, that it is generated in the clouds, and falleth downe in the field, in a circle, on those round circles, which are sayn in many fields, that ignorant people affirme to be the rings of the Fairies dances. It is certayne, that quicksilver hath divers times fallen out of the clouds, as we have declared in the treatise of Wonderfull and marveylous raine: but

but whether it so fall in circles it is doubtfull. The most probable opinion is, that it is generated of moist vapours of the earth, coacted by cold, much like to water, as Brimstone is of hote fumes, coacted by cold, much like to fire. And thus much of metals.

Of Stones.

Stones. STones, the fourth kinde of earthly mixed bodies, have two manner of generations, by most contrary qualities: for heat doth harden moist bodies into stones, as we see, that of clay, it maketh exceeding hard brick.

Also the thunderbolts in the clouds, are generated by heat, as before hath beene shewed. But cold doth by congealing, generate many more stones than heat doth, for the most part of all the stones that are digged out of the earth, are generated by cold, which is able to convert any other kind of mixed substance into stone, as hath beene partly shewed in the nature of wels and springs, of which, there be some in England, which by their colde, turne wood, or any like thing into stones. I have

haue seene a peece of rotten wood, which in light was very light, and like wood, but in handling, a very stone that was taken out of such a Well. Also of other things taken out of the earth, turned into stones, I haue seen and found my selfe, flyes, with head and wings very hard stones, also, I haue seen a heart, a birds tongue, a beasts stone, a peare, a plumme; and divers other things turned into hard stones.

Of the divers kinds of stones.

Stones may first be divided into rude and beautifull: the ruds containe those great Rocks, which are generated by many small parts ioyned together, and the common pibble stones, that be found every where in the earth, among gravell, and on the shore of the Sea, or banks of the Rivers. These are generated of grosse and earthly humours, congealed by cold, and because they be neyther faire of colour, nor thorow shining, and also common, they are contemptible. The faire or beautifull stones, be either great or small. The great be, as marble of divers kinds and colours, alablaster, and such like, which being hard and well concocted, may be polished and become

Rockes.

Pibble stones.

Marble

become beautifull. Their colour is as they are mixed being uncongealed, so is their pureneſſe. The ſmall are more pꝛecious, and they be either thick oꝛ pellucide. The thick be neither ſo faire noꝛ ſo pꝛecious, as the Achates, the Jaſper, Praſſios, ec. Theſe conſiſting of a pure matter, and not very watry, are congealed into ſuch ſtones. The cleare ſtones be liquoꝛs concreate, as the Diamond, the Saphir, the Emerald, ec. they are pꝛaiſed foꝛ their greatneſſe, hardneſſe, clearneſſe, and faire colours, of which enough hath bin ſpoken, ſaving that ſome be of opinion, that theſe be generated by heat, becauſe the beſt are found in hot countries, in the Eaſt, and in the South. Anſwere may be made, that the hotter the ayꝛe is, the colder is the earth: ſo that reaſon is of ſmall foꝛce.

Achates. Jaſper. Praſſios.

Diamond. Saphir. Emerald. The praiſe of precious Stones.

Of the vertue of ſtones.

SOme perchance, would looke that we ſhould make a long diſcourſe of the vertue of ſtones, and would be well content that we ſhould entreat of divers pꝛoperties of gemmes and pꝛecious ſtones, which matter though it be out of our purpoſe (which conſideꝛeth only the generation) yet ſeeing it is

The vertue of Stones.

is not out of their expectation, some thing briefly, and yet sufficiently shall be said of the vertue of stones.

The vertue of stones either naturall or magicall.

That vertue that is ascribed unto them, is either naturall, or magicall. Naturall vertue, is either that which is known to have a naturall cause, or a naturall effect, as the Magnes or Load-stone, to draw Iron, which is by a similitude of nature, and such an appetite, as is between the male and the female. Also, the said Magnes moveth toward the North, and as some say there is another kinde, found in the South, that draweth toward the South. They say, that there are great hils of this stone in the North and South, which maketh it loke that way.

Magnes.

Other bring a Mathematicall reason, which because it is more curious, than can be understood of the common sort, not exercised in Geometry, I omit.

Ieat and Amber draweth chaffe.

The Ieat and Amber draw hayres, chaffe, and like light matter, but being before chafed; for heat is attractive.

Also the precious stone called Asteroites, moveth it selfe in vineger, the sharpnesse of the vineger pearcing it, and the ayre excluded, driving it forward. These

vertues

vertues because I have seene, I have set for an example: generally all other like naturall vertues, proceede of like naturall causes, which by their effect, the ingenious must seeke to finde out. As for magicall vertues, be they, which are grounded of no reason, or naturall cause, which if they take effect, it is rather of the superstition & credulity of him that useth them, than of the vertue of the stones. As that an Emerald increaseth love, a Saphir favour, a Diamond strength, and such like vertues, of which Albertus in his age, surnamed the great, tooke paines to write a booke, which I suppose to be englished. To conclude with the cause why stones melt not, as metals doe, may be gathered, by that which hath bin said before, because they are congealed past that degree, and also because there is left in them, no unctuous, or clammy matter. Let this suffice for stones: and so the whole purpose is at an end. Albertus Magnus.

FINIS. D. Folk.